Communicating the Value of Water Delivery Services to Influence Consumer Acceptance of Infrastructure Investments

By

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ABSTRACT

The U.S. EPA estimates that there are approximately 240,000 water main breaks per year in the United States (U.S. EPA, 2011a). While drinking water system assets, particularly pipes buried underground, can last for many years, this infrastructure largely goes unnoticed until a failure occurs that disrupts the delivery of water to the community's homes and businesses.

Many factors contribute to the need to reinvest in our nation's water infrastructure. The pricing of water services should accurately reflect the true costs of providing safe drinking water to consumers, a strategy known as full cost pricing (U.S. EPA, 2012a). But because of historically low water rates due to longevity of water system assets, deferred maintenance, and governmental subsidies, many rate payers resist increases in their water bills and water systems have traditionally found it difficult to raise rates to pay for needed future capital investments (American Water, 2011a).

The effects of our aging infrastructure coupled with our changing climate have heightened the urgency to reinvest in water infrastructure for many utilities over the past decade. Substantial educational and outreach materials have been developed for national and state level Value of Water campaigns to support this investment. Water systems and water associations are taking the lead in establishing communication with their communities and best practices should be shared across the industry on how to effectively communicate the great need of repairing and replacing our nation's infrastructure.

Keywords: Water System, Water Utility, Value of Water, Communication, Rate Setting, Rate Increases, Infrastructure, Assets, Capital Improvements

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Introduction

"It is very, very difficult to run a first-class county or city on second-rate infrastructure." —Commissioner Melanie Worley, Douglass County, CO

Our nation's drinking water infrastructure received a "D" on the American Society of Civil Engineers 2013 Infrastructure Report Card (ASCE, 2013). The majority of the United States' extensive drinking water pipe network system was installed over 50 years ago and nearly a century ago in some older metropolitan cities (AWWA, 2012a). Since much of this infrastructure is located underground, its deterioration is going largely unnoticed by the general public until a water main break inconveniences a daily commute or a service disruption requires a 'boil water' advisory. The U.S. Environmental Protection Agency (U.S. EPA) estimates that $384.2 billion will be needed over the next 20 years to repair and replace this infrastructure for the approximately 52,000 community water systems and 21,400 non-community water systems that are eligible to receive Drinking Water State Revolving Fund (DWSRF) loans (U.S. EPA, 2013a). Congressional funding authorizations for the DWSRF have decreased over the last three years (CRS, 2013); as this trend is expected to continue with future funding much of the costs needed for infrastructure improvements will come directly from customers of public drinking water systems through the fees or user rates charged for their water usage. The terms 'water systems' and 'water utilities' are used interchangeably throughout this paper. In addition, the terms 'assets,' 'capital,' and 'infrastructure' are also used interchangeably.

Water rates are fees charged to customers to fund a water system's daily operation and maintenance and long-term capital improvements. Water rates across the country are traditionally very low compared to the true costs of delivering safe drinking water, with some not covering the full costs of water treatment and delivery nor the capital improvements and

replacement that are required for the infrastructure that distributes water to homes and businesses (U.S. EPA, 2012a). Replacing the country's aging pipes will require significant local investment and water rates in many communities across the country will likely have to be increased. However, many rate payers resist increases in their water bills and water systems have traditionally found it difficult to raise rates to pay for needed future capital investments (American Water, 2011a). Most Americans pay less than $3.75 for every 1,000 gallons of drinking water delivered to their taps, with U.S. EPA reporting that the median rate per thousand gallons charged to residential customers is $2.89 (AWWA, 2012a; U.S. EPA, 2009). The general public must understand and appreciate the true cost of the process needed for the delivery of safe, clean water.

Research Question and Project Methodology

The condition of water infrastructure in the United States (U.S.) is deteriorating. This research focuses on how water utilities are effectively communicating to customers the need for infrastructure investments. Drinking water professionals representing system owners and operators, water utility associations, private companies, public entities, and non-profit organizations have taken hold of the idea that the public needs to understand the value, or the importance, of water to be amicable to rate increases. As a result, a number of outreach campaigns have been developed by various stakeholders to educate the public on this topic. This Master's Project explores the different drivers for infrastructure replacement investments, the outreach campaigns that have been created to educate the public on the value of water delivery services, and selected cases of three water systems who have communicated to their customers the need for rate increases. These systems were selected based on similar characteristics such as system size, ownership, and availability of electronic public information. An analysis of how the different

water systems used communication techniques to influence consumer appreciation of the efforts needed to deliver safe drinking water and their acceptance of rate increases was developed from the information provided to customers through the utility's webpages. Additional communication strategies and messages that can be used to educate communities on the need to reinvest in water infrastructure are also highlighted.

The methods used to conduct research for this project include a literature review, interviews with key knowledgeable stakeholders, and an analysis of selected utility messaging approaches.

Literature Review

A literature review was performed to determine the materials and campaigns that have been developed to bring public awareness to the value, or importance, of water. National and state campaigns and their accompanying outreach materials such as websites, factsheets, public service announcements, infographics, e-learning tools, communication strategies, Op-Eds, sample social media posts, and white papers were reviewed. In addition, conferences and workshops that focused on water system management principles, including capital planning, customer service, and utility branding, were attended. Specifically the 2014 AWWA/WEF Utility Management Conference (February 2014) and the Water Words that Work Workshop (March 2014) were attended to hear presentations and participate in interactive workshops that focused on the latest communication and outreach techniques that utilities can utilize to educate their customers on the need to invest in infrastructure improvements.

Interviews

Five interviews with key knowledgeable stakeholders contributed to the knowledge of this subject matter with one representing each of the following groups: major water association

(National Association of Clean Water Agencies), state drinking water program (New York State Department of Health), federal government (U.S. EPA, Region 1), academia (Michigan State University), and a technical assistance provider (New Mexico Environmental Finance Center). These individuals were selected based on relationships from my current working experience at the U.S. EPA's Office of Ground Water and Drinking Water. Each stakeholder represented the viewpoint from an individual group that regularly works with water systems or works with stakeholders that regularly work with water systems. The discussions within the interviews were geared on the desired outcomes of value of water outreach campaigns that they are involved with and/or their overall experience with working with water systems to effectively communicate with customers and decisions makers. This approach led to a diverse snapshot of different perspectives from individuals who represent that particular group.

An appointment with each of the individuals was scheduled for an interview for this Master's Project. Individual telephone calls or face to face meetings were conducted from January – April 2014. Questions were geared to learn about the desired outcomes of existing communication strategies and campaigns on the value of water, prior research conducted on the need for infrastructure investments, observations and trends of water system pricing, preparing communication materials for the public, the challenges they see in water systems' ability to communicate the need for rate increases to pay for infrastructure upgrades, and desired future contributions to the subject matter from the U.S. EPA.

Each dialogue was unique due to different levels of familiarity, and in some cases preexisting relationships, with the subjects. While care was taken to ask similar questions during each interview, the discussion within the interviews varied based on the differences in expertise of the interviewees. The goal of the interviews was to learn about their experiences and opinions

related to water system managerial and financial management practices, infrastructure finance issues, and knowledge of effective communication techniques that water systems have successfully used. The following questions were helpful in structuring the discussion:

- In what ways have you worked directly with water systems?
- What do you think are the biggest challenges that water systems face today?
- Do you think that water systems are concerned about aging infrastructure issues? Are you familiar with 'value of water' campaigns?
- Have you been involved with a 'value of water' campaign to convey the importance of water to the general public before?
    - If yes, what was the driving force of this type of campaign?
        - Why was this campaign developed?
        - What were the (or what are the expected) results of the campaign?
        - In your opinion, was it effective?
        - What are potential challenges in implementation?
    - If no, are you aware of any such campaigns?
        - Do you think that a campaign like this is needed?
        - What would be the driving force to begin this type of campaign?
- What are challenges that systems face when proposing rate increases?
- When systems find the need to raise water rates, what are the ways that this information can be communicated to the public?
    - Of these, which do you think is the most effective?
    - Is the public generally receptive to rate increases when communicated to them in this way?
- Would you be interested in participating in a larger discussion, facilitated by U.S. EPA, on this issue of communication?

These discussions helped to shape the scope of this research project by gaining knowledge of existing efforts, identifying gaps or areas that this research project could fulfill,

and gauging expectations for U.S. EPA's future role in this area. Their responses are used as part of the water system analysis and recommendations for future activities.

Utility Messaging Approaches

The outreach efforts of three water systems were analyzed to determine the effectiveness of their communication to customers on the need for rate increases. These systems are public drinking water systems defined as utilities that serve at least 15 service connections or 25 persons. Each of these systems is considered a large sized public water system that serves a population size between 10,000 – 100,000 people. Two of the systems chosen for this Project fall within the lower spectrum of this size category and one system falling within the mid spectrum of this size range (U.S. EPA, 2014a). This size category was chosen due to the economies of scale realized by systems serving this population size. Expenses per thousand gallons of water processed tend to decrease for the system as the system's size increases, indicating that economies of scale are inherent in the production and delivery of drinking water. Additionally, total system revenues sharply increase from the preceding size category for both publicly owned and privately owned systems for this size category of systems (Table 1) (U.S. EPA, 2009).

Table 1 - Average annual water system revenue (U.S. EPA, 2009)

Average Annual Water System Revenue				
	Publicly owned systems	Privately owned for profit	Privately owned not for profit	Ancillary
<501	$46,325	$18,377	$17,646	$2,840
501-3,300	$477,446	$143,831	$418,825	$49,976
3,301-10,000	$523,298	$332,134	$751,584	
10,001-100,000	$3,341,898	$4,956,673	$2,848,003	
>100,000	$41,419,524	$59,932,110	$45,989,681	

These water systems are utilizing different methods to communicate upcoming rate increases to help their customers understand the need for future capital investments and the ongoing operation and maintenance required for the systems to be able to deliver safe drinking water to their taps. A comparison of the different communication approaches was made and additional best practices that water systems can use to communicate with their customers are provided as recommendations.

Background: U.S. Water Infrastructure Needs

The costs of the daily operation of a system, ongoing asset maintenance, and long-term capital improvements all contribute to system expenses. Additional costs that utilities incur for effective water system operation and management include employee salaries and benefits, administration expenses, public outreach initiatives, emergency preparedness needs, and complying with water quality and environmental regulations. Further costs that systems may also face include the costs of importing water supplies from distant sources and the energy costs needed to transport water (ACWA, 2011b; Raucher R., 2014).

Drivers for Infrastructure Rehabilitation and Renewal

Regardless of the population size of the community that the water system serves, many utilities have infrastructure that was installed 50 – 100 years ago that is reaching the end of its useful life. To provide context for how utilities communicate the need for investing in drinking water infrastructure, it is important to understand the reasons why infrastructure needs to be replaced. Infrastructure condition as well as water availability are major drivers for replacement and renewal decisions. Aspects of each are explained in the sections below.

Infrastructure Condition

Asset Failure

The U.S. EPA estimates that there are approximately 240,000 water main breaks per year in the U.S. (U.S. EPA, 2011a). The length of time an asset has been installed and factors such as the asset installation methods, maintenance, and material, as well as the soil and climate conditions in contact with the infrastructure can affect an asset's condition (Morgan, 2012).

Asset age is usually the first determinate in assessing an asset's condition. All assets have finite life cycles for which their intended purpose will be useful. The material used for water infrastructure will eventually wear down and need to be repaired and ultimately replaced (Morgan, 2012).

The type of maintenance that is typically performed also contributes to an asset's condition. Whether a system performs routine maintenance on a set schedule or if the system normally defers maintenance and only performs emergency maintenance when an asset fails will impact an asset's overall life cycle.

The type of asset and its material also contribute to its longevity. Cast iron pipes, which can be dated from the late 1800s, last for approximately 120 years. Pipes that were installed after World War II have an average lifespan of 75 years. In addition, assets used in the treatment plant typically have useful lives of about 15 to 50 years (CRS, 2010).

Improperly installed infrastructure can affect the amount of time an asset is able to perform as designed. Pipe that is not well supported or that has inadequate surrounding compaction can move during pressure surges and loosen pipe joints. In addition, leaks can result from bolts that are not tightened properly, joints that are welded incorrectly, and pipes that are not installed at a sufficient depth under areas of heavy traffic loads (Morgan, 2012).

Weather events such as floods, earthquakes, and hurricanes can damage assets. The natural chemistry of soil can also affect the integrity of assets by causing corrosion to underground pipes (Morgan, 2012).

Water Loss

Infrastructure within the distribution system that is in poor condition can lead to a significant amount of clean, treated water that is not delivered to customers. Leaky pipes and water mains that distribute water from the water system to end users cause an average of 16 percent of water loss for systems across the country. This loss is likely an even higher percentage as not all systems have performed water audits or other water loss control programs to measure the amount of water being lost within their utilities (U.S. EPA, 2013c).

Water Availability

Lack of Water

Drought events throughout the southern and western states have highlighted water availability issues that many communities are facing. Water sources for a number of water systems in Texas, Colorado, and California are going dry due to droughts experienced in 2012 and 2013. The threat of water not being available for regular use is causing state regulators to take action. In early 2013, Texas amended their Water Code to require water systems to contact the Texas Commission for Environmental Quality (TCEQ) when they are "reasonably certain" that they will run out of water in 180 days so the agency can assist them in developing a plan for continuing to supply safe drinking water to their communities (Young, TCEQ, 2013). As of October 30, 2013, 1,231 of the 4,653 community water systems in Texas (26.5 percent) were under voluntary or mandatory use restrictions (The Texas Economy, 2013). In Colorado, a combination of severe drought conditions followed by heavy precipitation events caused massive

floods in September 2013. The ground was so parched that precipitation couldn't percolate through the soil and widespread damage occurred from the resulting flood (Harold, CDPHE, 2013). And in January 2014, California made headlines that their drought has caused 17 water systems to risk running out of water within four months. As a result, the governor of California asked the public to reduce their water usage by 20 percent (ACWA, 2014).

Too much Water

Climate changes can also bring more water than is necessary, affecting the ability of water systems to function properly. Hurricane Irene caused damage to water systems from North Carolina through Vermont in 2011. Impacts reported by the water systems included loss of power, inability to reach the water system due to closed roads, loss of pressure, and contamination of water sources (Figure 1) (WRF and The Cadmus Group, 2012). The combined effects of Hurricane Irene, closely followed by Tropical Storm Lee, caused 126 systems to issue boil water orders affecting approximately 2.2 million customers in the state of New York (NYSDH, 2013).

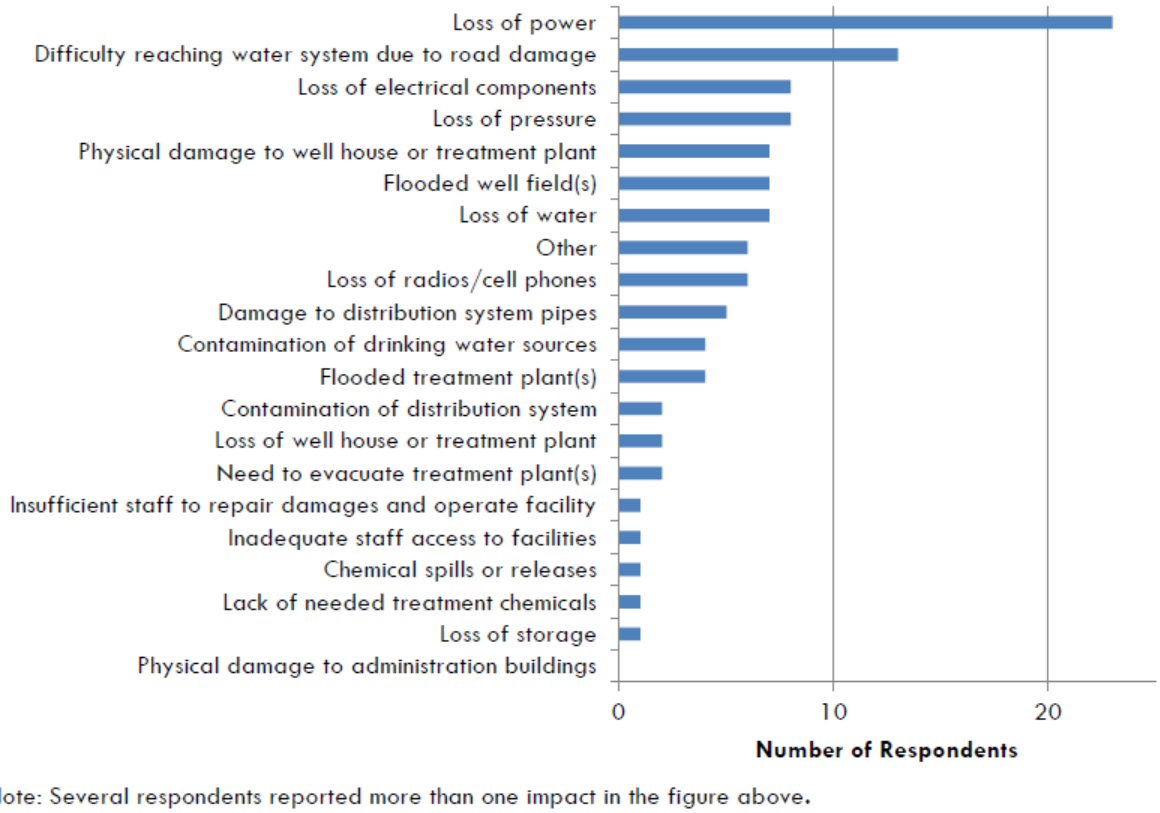

Figure 1 - Impacts reported by drinking water systems from Hurricane Irene (WRF and The Cadmus Group, 2012)

Paying for Infrastructure Rehabilitation and Renewal

The need to repair, rehabilitate, and replace water infrastructure comes at a hefty price tag. The American Water Works Association's (AWWA) *Buried No Longer: Confronting America's Water Infrastructure Challenge* Report estimates that an investment of at least $1 trillion will be required through 2035 to reinvest in existing water pipe assets as they reach the end of their useful lives and also for expansion to serve a growing population in the South and West (AWWA, 2012a). The U.S. EPA's *2011 Drinking Water Infrastructure Needs Survey and Assessment* estimates that capital investment needs for water infrastructure are $384.2 billion for the 20 year period of January 1, 2011 – December 31, 2030. This estimate includes infrastructure for water systems eligible for funding, though not necessarily funded, through low-interest loans

from the Drinking Water State Revolving Fund (DWSRF). The DWSRF does not fund activities related to growth (U.S. EPA, 2013). While these reports use different parameters and methodology, they "offer powerful insight into both the investment needs of the sector over the coming years as well as significant infrastructure planning and management issues that influence the speed and efficiency with which the sector can address current and future infrastructure investment" (Shanaghan, 2012).

Water system managers set user fees, or water rates, that their residential, commercial, and/or industrial customers pay for using water. Rates are set by each water system and are determined on a local level rather than by a dollar figure predetermined by the state or federal government. Rates can be structured in a variety of ways to encourage conservation of water or to attract businesses that utilize drinking water in their operations. These rates translate into monthly or quarterly bills that are sent to water system customers. Water systems use these fees to fund both the daily operation and maintenance of a water system as well as the long-term capital investments needed to sustainably deliver safe water to customers. The pricing of water services should accurately reflect the true costs of providing safe drinking water to consumers, a strategy known as full cost pricing (U.S. EPA, 2012a). But because of historically low water rates due to longevity of water system assets, deferred maintenance, and governmental subsidies, many rate payers resist increases in their water bills and water systems have traditionally found it difficult to raise rates to pay for needed future capital investments (American Water, 2011a). Studies have shown that the level of investment needed to replace infrastructure and maintain current levels of existing water service could triple household water bills for some communities (AWWA, 2012a).

Public Awareness and Outreach Initiatives

National Surveys

Various surveys have been performed proving that people care about water. A Gallop Poll conducted in 2009 with 1,012 adults indicated that out of all environmental questions that were asked, those who were polled answered that they worried the most about pollution of drinking water (Figure 2) (Saad, 2012; Eckl, 2014).

I'm going to read you a list of environmental problems. As I read each one, please tell if you personally worry about this problem a great deal, a fair amount, only a little, or not at all. First, how much do you personally worry about…?

	Great deal (%)	Fair amount (%)	Only a little/Not at all (%)
Pollution of drinking water	59	25	16
Pollution of rivers, lakes, and reservoirs	52	31	17
Contamination of soil and water by toxic waste	52	28	19
Maintenance of the nation's supply of fresh water for household needs	49	31	19
Air pollution	45	31	24
The loss of tropical rain forests	42	26	32
Extinction of plant and animal species	37	28	34
The "greenhouse effect" or global warming/Global warming	34	26	40

GALLUP POLL, March 5-8, 2009

Figure 2 - Data from Gallop Poll, 2009 (Saad, 2012; Eckl, 2014)

In 2010, the ITT Corporation conducted a Value of Water Survey of 1,505 American voters to ask 82 questions related to feelings about drinking water issues. Their results found that American voters value water over other common services. This included electricity, heat, Internet, cell phone, land line phone, and cable television (Figure 3) (ITT, 2010).

How important is this service to you personally?

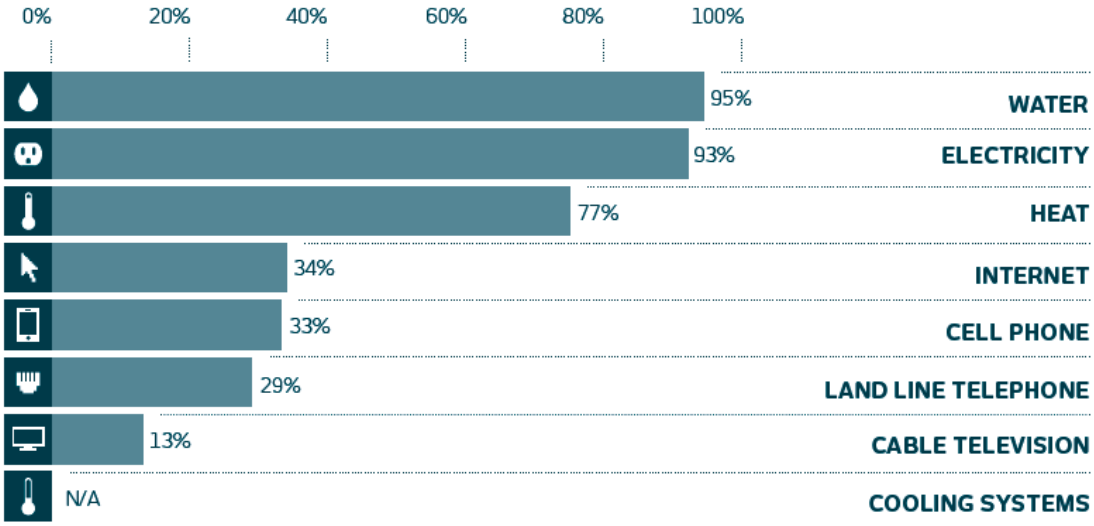

Figure 3 - Data from ITT Value of Water Survey (ITT, 2010)

In 2012, Xylem conducted the Value of Water Index Survey that ITT had previously conducted in 2010. Additional statements were added to the poll. One of these new statements asked the respondents to indicate if they were willing to pay more money to address the crumbling water infrastructure system in the U.S. – 29 percent of the people polled answered that they strongly agreed with that statement and 35 percent answered that they somewhat agreed with the statement (Figure 4). A follow up statement asked the respondents to indicate if they were willing to pay more each month to continue to have access to safe, clean water – 41 percent of the people polled answered that they strongly agreed with that statement and 30 percent answered that they somewhat agreed with the statement (Figure 5) (Xylem, 2012a).

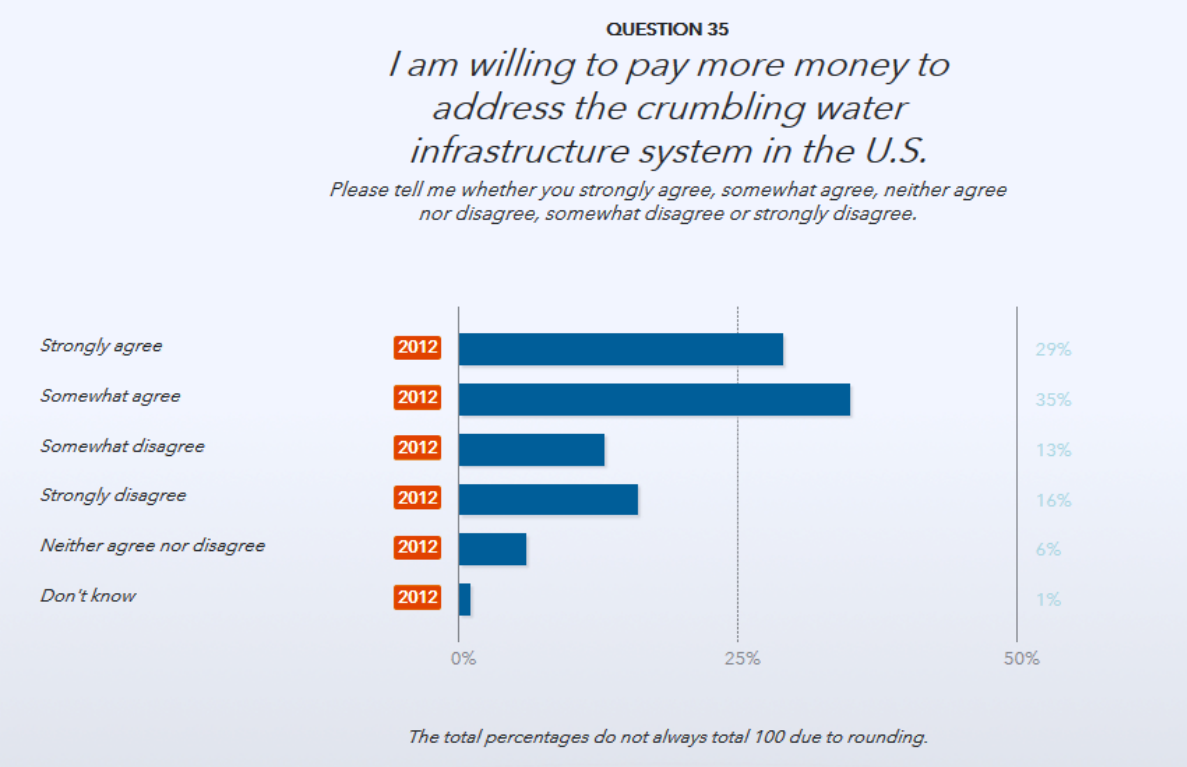

Figure 4 - Willingness to pay survey question (Xylem, 2012a)

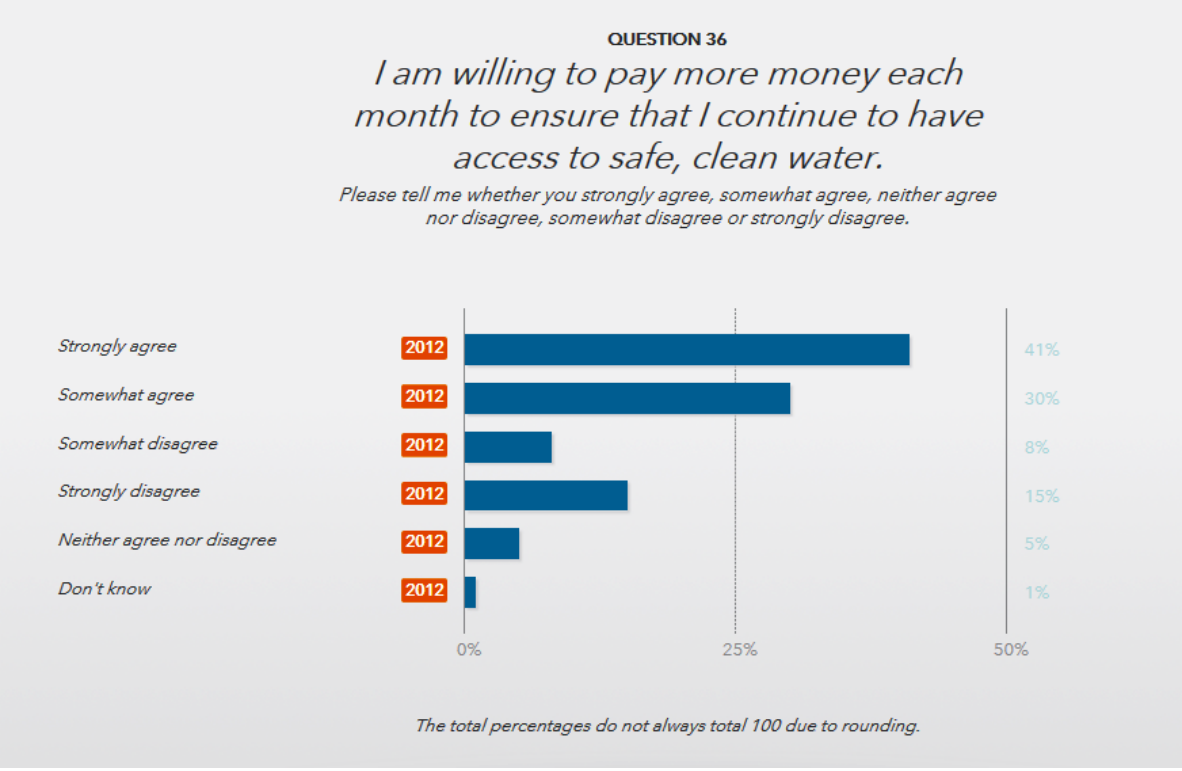

Figure 5 - Willingness to pay monthly survey question (Xylem, 2012a)

While the general public cares about water, they do not necessarily understand the effort or cost that is required to get the water from its source (e.g., lake, river, groundwater, etc.) to their homes. Safe and clean water delivery is a "silent service" with much of the infrastructure buried underground. People are not able to see the physical infrastructure that carries water from the water system to the taps in people's homes and businesses which may influence their perception of how water gets to their faucet. This contributes to a lack of recognition of the true cost of water service. Further adding to the confusion, or ignorance, of water prices is the practice that some communities take in combining multiple rates for different services on one bill (e.g., water, sewer, and stormwater fees), making it more difficult for customers to decipher how much they are paying for their water usage (Raucher, R., 2014).

What people are familiar with is how much they have paid for water in the past. Water rates across the country have historically been very low compared to the true costs needed to operate and maintain a water system. This is due to the installation of many long-lived assets 50 – 100 years ago, the federally subsidized infrastructure construction in the 1970s and 1980s, and the deferred maintenance decisions that utility decision makers continuously make (Raucher, R., 2014). These factors have perpetuated the belief that water should be free as it is a fundamental human need supplied by the earth, rather than a delivery service provided by a water utility (American Water, 2011a).

Because of the challenges that water systems, and also wastewater systems, have encountered when raising rates, a number of water utilities and their associations have developed communication campaigns to help the public understand the value, or importance, of drinking water and wastewater services. National campaigns were reviewed for this Project to determine the types of materials have been developed to educate the public on the importance of water

delivery services. State campaigns in California, Colorado, and New York were also reviewed. These state campaigns were selected because of their state's water availability and climate change struggles within the last decade.

National Campaigns

American Water Works Association (AWWA)

The American Water Works Association (AWWA) is the largest non-profit, scientific, and educational organization dedicated to water utility management and operation (AWWA, 2014a). AWWA developed the outreach campaign *Only Tap Water Delivers* in 2006 to help water systems and public officials communicate the importance of drinking water to their community's quality of life. A number of materials have been developed through this campaign for water systems to educate their decision makers and their customers on the need for community reinvestment in drinking water infrastructure (The Cadmus Group, 2009; AWWA, 2011a). The campaign materials focus on the themes of 1) public health protection, 2) fire protection, 3) support for the economy, and 4) quality of life. The goals of the campaign are to:

- Encourage community investment in water service and resources.
- Provide utilities with tools that help them communicate with consumers and decision makers about the value of tap water service.
- Encourage and equip public officials to speak about the importance of investing in water service and resources.
- Elevate the value of water service in the minds of consumers.

These materials are available free of charge to AWWA utility members and can be modified to fit local characteristics and needs. The materials that are available to implement this campaign include various Print Ads in English and Spanish for placement in local publications, a Radio Public Service Announcement in English and Spanish, Bill Stuffers containing various

messages, Consumer Handouts, Children's Activities, Factsheets, Campaign Logos, a Web Banner, Campaign Talking Points, Campaign Speech, and Op-Ed, PowerPoint Presentation, Editorial Board Briefing Guide, and Campaign Analytics (AWWA, 2011a; AWWA, 2014b).

Water Environment Foundation (WEF)

The Water Environment Foundation (WEF) is a not-for-profit technical and educational organization that represents water quality professionals (WEF, 2014). WEF developed an outreach campaign *Water is Life, and Infrastructure Makes it Happen* with the tagline *Water's Worth It* to help "communities envision, build, maintain and improve life-sustaining water and wastewater systems." The objectives of the campaign are to inform the general public and elected officials on the role of water and wastewater infrastructure in delivering water to homes and businesses and in cleaning and returning it to waterbodies to be used again. The materials in this campaign are available to any interested stakeholder for free download from their website. Some of the materials can be customized to meet local needs. The materials available to implement this campaign include Ads, Public Service Announcements (PSAs), Fact Sheets, Door Hangers, and Bill Stuffers highlighting various messages. In addition, The Infrastructure Beneath Our Feet Schematic, a Media Guide, Presentation Material, FAQs, Sample Press Releases, Public Opinion Survey, and a Survey Implementation Guide are available to water systems, decision makers, and the general public through this campaign (WEF, 2011k).

American Water

American Water is a publicly traded company that manages and operates water and wastewater systems across the U.S. American Water owns or operates 500 treatment plants, 1,000 wells, 100 wastewater facilities, approximately 90 dams and 46,000 miles of distribution and collection mains (American Water, 2013). As a private company, American Water has a

strong interest in teaching their customers the value of their water services and in 2011 developed a Value of Water White Paper, Value of Water Poster, Value of Water E-Learning Module, and a Factsheet titled *Water's Worth: Understanding the Value of Clean Water*.

The Value of Water Coalition

The Value of Water Coalition consists of representatives from national water associations and other private and non-profit organizations that see the need for educating the general public on the importance of water and wastewater services through blogs, social media, infographics, and facts. The Coalition's website debuted in October 2013. This campaign stresses that the water we use is borrowed, and eventually returned to the water cycle through wastewater treatment (The Value of Water Coalition, 2013). The Coalition is led by the U.S. Water Alliance and participating organizations include American Water, American Water Works Association (AWWA), Association of Metropolitan Water Agencies (AMWA), CH2MHill, MWH, National Association of Clean Water Agencies (NACWA), National Association of Water Companies (NAWC), Suez Environment/United Water, Veolia Water, Water Environment Federation (WEF), and Xylem. At the time of this Project, the Coalition is working on developing messaging strategies for educating the general public on the value of drinking water and wastewater services (Personal Communication, NACWA, 2014).

Others

Other organizations and groups such as Xylem, Circle of Blue, and the Local Government Advisory Committee (LGAC) have produced various materials such as videos and infographics to educate the general public on the value of water. These materials can be found on their respective websites.

State Campaigns

Value of Water campaigns have also been developed at the state level. Drivers such as infrastructure failure and water availability have triggered state agencies and organizations to develop state specific materials to help water systems explain the importance of safe drinking water to their customers and decision makers. The Association of California Water Agencies, Colorado WaterWise, and New York Water and Wastewater Education and Outreach Committee have recently created outreach initiatives on this topic.

California

Association of California Water Agencies (ACWA): Value of Water Campaign

Water in the state of California has been a managed resource since the late 1800s. The drought events over the past decade have brought attention to their state-wide water management efforts. As part of this venture, the Association of California Water Agencies (ACWA) initiated a Value of Water campaign to help Californians understand how water is delivered to their homes and businesses. ACWA surveyed 600 Californians to provide research for developing their campaign materials. The results indicate that those surveyed believe they are getting a "good value for the water service they receive and that their water supplier is doing a good job." The results also suggested that Californians believe their water costs are reasonable compared to other utilities and services, view water as a service rather than a product, and recognize that multiple factors are involved in determining what they pay for water, but are not clear on the real impact or significance of these factors (ACWA, 2011a).

A factsheet and video are available to the public on ACWA's website. The *Fast Facts on Rising Water Costs* factsheet describes the factors that affect the cost of treating and delivering water. The factors described include rising treatment costs, aging water infrastructure, increasing

energy costs, cost of developing new supplies, and invasive species (ACWA, 2011b). The *Water: The Best Deal Around* video features staff from the West Basin Municipal Water District and Las Virgenes Municipal Water District describing how tap water is a bargain. This 30 minute video focuses on the message of "Californians are guilty of taking safe Californian tap water for granted." Tap water in California typically costs consumers less than a penny per gallon, making this service a cost effective deal when the expertise of the water professionals and the energy costs required to treat and deliver the water are taken into account (ACWA, 2011c).

Materials available only to ACWA member utilities include the Value of Water Toolkit, sample Op-Eds, letters to the editor, and sample notices that water systems have used to educate their customers of upcoming rate increases (ACWA, 2014). The Value of Water Toolkit was developed in 2011 and Sample Op-Eds and Letters to the Editor that utilities could send to journals and local newspapers were updated in 2012. Different versions can be used based on the topic the system would like to promote including the general value of water, the energy/water nexus, the importance of asset management, and the reliability of safe drinking water. Sample Facebook posts and tweets are also provided as follow ups to these initiatives. Materials available in this campaign include the *Public Water Agency Guide to Communicating the Value of Water to California Consumers*, *California Tap Water - The Best Deal Around* Bill Stuffer, *Fast Facts on Rising Water Costs*, Key Messages About the Rising Cost of Water, *Spread the Word: A Checklist for Communicating the Value of Water*, Op-Ed and Letters to the Editor, and sample Value of Water Facebook Posts and Tweets (ACWA, 2011a).

Colorado

WaterWise: Value of Colorado's Water Campaign

In 2011, the Colorado Water Conservation Board (CWCB) developed a multi-year, statewide communications plan to increase appreciation of Colorado's water resources. CWCB awarded a $25,000 contract to GBSM to identify best practices in water awareness efforts, assess a baseline on Coloradan's attitudes on water, facilitate a dialogue with stakeholders to ensure that the appropriate issues are being addressed, and develop a value of water communications plan (Colorado WaterWise, 2011a). The research that was conducted for this effort showed that people in Colorado recognize the importance of the state's water resources to economic prosperity and the importance to themselves personally but that they are unfamiliar with basic water terms (Colorado WaterWise, 2011b). The survey performed also showed that water systems need and would use web-based communications tools including videos, fact sheets, and social media information to promote the value of water in the state (Colorado WaterWise, 2013a).

The communications plan that was developed aims to elevate overall public consciousness about water in Colorado. Mass-media advertising with a variety of mediums including television, radio, billboard, print, and transit advertising and establishing tighter-knit media relations with continuous pitching of water stories were the highest ranked options to use to gain public interest and understanding in water. Supporting tactics such as developing a website, using social media, and producing printed materials were also included but were not as emphasized as the advertising options (Colorado WaterWise, 2011b). Resulting from the baseline research the campaign theme will center on either the life cycle of water, the projected shortfalls of water, the true cost of water, or the varied uses of water (Colorado WaterWise, 2013c). Their project need is described as "Sustainable management and protection of our water

is fundamental to a positive future for Colorado. This project will develop a toolkit to better communicate that water is a limited resource in our semi-arid climate and its protection, conservation, and investment in are essential to support the quality of life and economic prosperity of all Coloradans" (Colorado WaterWise, 2013a). A sponsorship approach has been selected to be used to develop the new "Value of Colorado's Water" Communication Toolkit. Sponsors, consisting mainly of Colorado water systems, can pay between $500 –$10,000 to be recognized in various publications and have access to the Toolkit once it's developed. As of April 4, 2014, $29,000 of the $40,000 goal had been collected for the development of the Toolkit. The Toolkit is expected to be complete by January 2015 (Colorado WaterWise, 2013b).

New York

Water and Wastewater Education and Outreach Committee (WWEOC)

New York's Water and Wastewater Education and Outreach Committee (WWEOC) is "working to elevate, promote and attract talented individuals into the water profession and to raise awareness of the value of water and wastewater services with the public and elected officials in New York State and nationwide" (Environmental Finance Center, Syracuse University, 2014). The committee was initiated in 2007 and includes representatives from federal, state and local government, associations, non-profits, water and wastewater system owners and operators, educators, and water and wastewater consultants (Environmental Finance Center, Syracuse University, 2014; Personal Communication, NYSDH, 2014). One of the recent topics the committee has been focused on is the value of water. Members of the committee were aware of the pushback that water systems were getting from stakeholders on rate increases. They saw a need to educate customers that drinking water is not free and that costs are involved as water is processed for safe use. As a result, the education and outreach committee developed a

Value of Water brochure between 2012 and 2013. This brochure is located on committee members' websites including the New York State Health Department and the Syracuse University Environmental Finance Center. The brochure was sent to water utilities within the state and they were encouraged to send the brochures to customers in future water bills. The brochure will be available in hardcopy during the Drinking Water Taste Test Contest that will be held in Albany County, New York during Drinking Water Week in May 2014 (Personal Communication, NYSDH, 2014).

WWEOC is currently in the process of developing a children's version of the brochure geared toward 3rd and 4th graders. The New York State Department of Education is a member of the committee and has helped to shape the content so that it can be incorporated into language arts and math curriculums. Once the children's Value of Water brochure is finalized, it will be sent to elementary schools and water systems throughout the state (Personal Communication, NYSDH, 2014). The committee hopes to develop public service announcements on the value of water and wastewater systems in the future (Environmental Finance Center, Syracuse University, 2014).

Value of Water Materials

The materials in Table 2 represent the types of resources that have been developed through national campaigns including AWWA *Only Tap Water Delivers*, WEF *Water is Life, and Infrastructure Makes it Happen*, and American Water *Value of Water* as well as state campaigns including ACWA *Value of Water*, Colorado WaterWise *Value of Colorado's Water*, and New York Water and Wastewater Education and Outreach Committee *Value of Water* to educate the general public on the value of water services. These resources focus on the use of graphics and messages to market to consumers.

Table 2 - Value of Water materials

	AWWA	WEF	The Value of Water Coalition	American Water	ACWA	Colorado WaterWise	New York Water and Wastewater Committee
Year Materials Posted	2011	2011	2013	2011	2011	2015 (expected)	2013
Bill Stuffers	✓	✓			✓		
Brochure							✓
Campaign Analytics	✓						
Campaign Logos	✓						
Campaign Speech	✓						
Children's Activities	✓						
Door Hangers		✓					
E-Learning Module				✓			
Factsheets	✓	✓		✓	✓		
FAQs		✓					
How-to Guide					✓		
Infographic							
Op-Ed	✓				✓		
Poster		✓		✓			
PowerPoints	✓	✓					
Press Releases		✓					
Print Ads	✓	✓					
PSAs	✓	✓					
Public Opinion Survey		✓					
Social Media Posts					✓		
Talking Points	✓				✓		
Video				✓			
Web Banner	✓						
Website	✓	✓	✓	✓	✓	✓	✓
White Paper				✓			

The Art of Communicating Utility Pricing

"Communication is not based on science; it is emotional" — Karen Raucher, Stratus Consulting

Water systems have traditionally been staffed with operators and that have the extensive technical expertise needed to operate a water system. However, operators typically do not have the expertise and experience needed to communicate with their stakeholders, and are generally uncomfortable in that role (U.S. EPA, 2011b). While the general public is not very technical in nature, they care about their communities and people tend to care about the quality of life for themselves and for their children (U.S. EPA, 1989). Recent surveys have shown that people care specifically about water and understand that it is important (Saad, 2012; Eckl, 2014). The art of communicating utility pricing is not telling customers how to feel but telling customers what needs to be done (e.g., rates need to be adjusted), why it needs to be done (e.g., infrastructure is failing), and how it will be done (e.g., phased rate schedule increase) (Eckl, 2014). Messages are very important pieces that should be well thought out before communicating to the public on potentially contentious issues like rate increases. Examples of effective communication strategies and messages are described in the following section.

Communication Messages

Communication and messaging should always be clear, concise, and compelling (Vidra, 2013). Utilities have a short amount of time to give a pitch and exchange knowledge when relaying messages to their stakeholders (Mastracchio, 2014). For this reason, a typical message should consist of 27 words or less, take nine seconds to get across, and have three points to be effectively communicated (Raucher, 2014). Another strategy to make messages clear, concise, and compelling is to utilize plain language. Plain language is communication that an audience can comprehend the first time they read or hear it (PLAIN, 2014). In addition, using images

instead of using many words can make messages more easily understood since looking at pictures is a natural ability, while reading is a learned skill. People tend to have a stronger response to pictures which can be more important in getting a message across (Eckl, 2014). Images that community can relate to are especially effective in developing persuasive arguments on the need to invest in water infrastructure (Personal Communication, U.S. EPA, Region 1, 2014).

Recommended Messages

The following messages are recommended in communicating the need for infrastructure investments. These messages emphasize the importance of the water delivery service that water systems provide, the increased quality of life that water systems provide, and the importance of maintaining water infrastructure. The messages that water utilities can use include:

- ***Water delivery is a service; infrastructure is needed for treatment and delivery of water*** (AWWA, 2011a).
- ***Growing populations and chronic underinvestment are putting pressure on our nation's aging water infrastructure*** (Xylem, 2012). ***Water utilities are critical to quality of life*** (Johnson Foundation, 2012a; SCAP, 2008; Westerhoff, 2005; Stratus Consulting, 2014).
- ***Failing infrastructure is bad news for the economy. People will leave the community if there is not a stable water infrastructure and supply*** (AWWA, 2004; Stratus Consulting, 2014; Navarret, 2014).
- ***The value provided in reliable water service justifies costs*** (Beecher, 2011; Beecher and Chestnutt, 2012; Pacific Institute, 2013b; Stratus Consulting, 2014).
- ***Water infrastructure protects public health*** (AWWA, 2011a).
- ***We are responsible stewards of water resources*** (Beecher and Chestnutt, 2012; Stratus Consulting, 2014).

Value of Water campaign materials were categorized according to the recommended messages. These materials can be used by water systems to convey the recommended messages to their customers on the need for infrastructure investments through rate increases (Table 3).

Table 3 - Value of Water materials containing recommended communication messages

	Outreach Material Title	Type of Resource	Author	Availability
Message	***Water delivery is a service; infrastructure is needed for treatment and delivery of water.***			
	Value of Water Poster (American Water, 2011b)	Poster	American Water	Available to everyone
	Only Tap Water Delivers (AWWA, 2012b)	Bill Stuffer and Print Ad – in English and Spanish	American Water Works Association (AWWA)	Available to members only
	The Infrastructure Beneath Our Feet Schematic (WEF, 2011f)	Poster	Water Environment Federation (WEF)	Available to everyone
Message	***Growing populations and chronic underinvestment is putting pressure on our nation's aging water infrastructure.***			
	Value of Water Infographic (Xylem, 2012c)	Infographic	Xylem	Available to everyone
	PSA #1 (WEF, 2011h) PSA #2 (WEF, 2011i)	PSAs	Water Environment Federation (WEF)	Available to everyone
	100 Years (WEF, 2011a)	Bill Stuffer	Water Environment Federation (WEF)	Available to everyone
	100 Years (WEF, 2011b)	Print Ad	Water Environment Federation (WEF)	Available to everyone

	Outreach Material Title	Type of Resource	Author	Availability
Message	***Water utilities are critical to quality of life.***			
	Tall Drink of Water (AWWA, 2012b)	Radio PSA – In English and Spanish	American Water Works Association (AWWA)	Available to members only
	Buried But Not Forgotten (WEF, 2011c; WEF, 2011d)	Bill Stuffer and Door Hanger	Water Environment Federation (WEF)	Available to everyone
	Lifeline Infrastructure Awareness (WEF, 2011g)	Bill Stuffer	Water Environment Federation (WEF)	Available to everyone
	Infographic: 10 Things You Should Know About Water (Circle of Blue, 2009)	Infographic	Circle of Blue	Available to everyone
Message	***Failing infrastructure is bad news for the economy.***			
	Buried But Not Forgotten (WEF, 2011c; WEF, 2011d)	Bill Stuffer and Door Hanger	Water Environment Federation (WEF)	Available to everyone
Message	***The value provided in reliable water service justifies costs.***			
	I'm not so easily replaced. (AWWA, 2012b)	Bill Stuffer	American Water Works Association (AWWA)	Available to members only
	Value of Water E-Learning Module (American Water, 2011c)	E-Learning Module	American Water	Available to everyone
	Water: The Best Deal Around Video (ACWA, 2011c)	Video	Association of California Water Agencies (ACWA)	Available to everyone
	Your Tap Water – The Best Deal Around (ACWA, 2011d)	Bill Stuffer	Association of California Water Agencies (ACWA)	Available to members only
	Sustainable Water Source Infrastructure Video and Case Studies (LGAC, 2007)	Video	Local Government Advisory Committee (LGAC)	Available to everyone
	Value of Water Public Service Announcement (PSA) (Xylem, 2012d)	Public Service Announcement (PSA)	Xylem	Available to everyone

	Outreach Material Title	Type of Resource	Author	Availability
Message	***Water infrastructure protects public health.***			
	Only Tap Water Delivers (AWWA, 2012b)	Bill Stuffer and Print Ad – in English and Spanish	American Water Works Association (AWWA)	Available to members only
	Cracks, Leaks, and Breaks don't fix themselves (WEF, 2011e)	Bill Stuffer	Water Environment Federation (WEF)	Available to everyone
Message	***We are responsible stewards of water resources and the environment.***			
	Do you know how often you turn me on? (AWWA, 2012b)	Bill Stuffer and Print Ad – in English and Spanish	American Water Works Association (AWWA)	Available to members only
	I want to be here for you. (AWWA, 2012b)	Bill Stuffer and Print Ad – in English and Spanish	American Water Works Association (AWWA)	Available to members only
	PSA #3 (WEF, 2011j)	PSA	Water Environment Federation (WEF)	Available to everyone

Messages that are Not Recommended

Messages that water professionals who are experts in communication recommend that water systems not use in communicating rate increases include:

- ***We have the lowest rates in our region.*** Each community is different and requires different water infrastructure needs. A water system boasting that rates are cheapest in a particular area doesn't take into account the many differences within the region (SCAP, 2008; Stratus Consulting, 2014).
- ***Water costs less than your cable bill*** (AWWA, 2004; Stratus Consulting, 2014). It is important for water systems to convey that delivering water is not a choice, while services such as cable television are a choice (Raucher, K., 2014).

- ***Water conservation will lead to lower bills***. Water systems have to find a balance between environmental stewardship and financial stability. The cost of the water delivery service can be decoupled from the amount of water that is used so conserving water may not always lead to lower bills for consumers (Johnson Foundation, 2012a; Stratus Consulting, 2014).
- ***Water conservation is to blame for higher bills.*** Assigning a negative connotation to an environmental stewardship is not in the best interest of the water system (Pacific Institute, 2013b; Stratus Consulting, 2014).

Evaluation of Utility Specific Outreach

This research focuses on three water systems that proposed to increase consumer water rates. These systems are all large sized water systems, serving populations between 10,000 – 100,000 people (U.S. EPA, 2014a). Two of the systems fall within the lower spectrum and one within the mid spectrum of the large size range. These water systems used different methods to communicate the need for rate increases to help their customers understand how future capital investments and the ongoing operation and maintenance are required for the systems to be able to deliver clean, safe water to their taps.

In addition to system size, the three water systems selected for this Project shared similar characteristics that allowed their communication strategies to be compared. These characteristics included system percentage of rate increase, growth, ownership type, and publicly available information on the rate increases. Each of the systems had proposed very high rate increases, greater than 40 percent, over a 5 year timeframe. The two systems that serve populations on the lower spectrum of the large sized category, the City of North Liberty and the City of Hutto, have communities that are rapidly growing. All are municipally owned water systems, accountable to a group of local decision makers (i.e., board of directors, city council, etc.) that ultimately approve the rate increase. And lastly, each system had information on their proposed rate

increases publically available on the internet. Table 4 synthesizes the similar characteristics of the three water systems at the center of this analysis.

Table 4 - Water system characteristics

Water System	System Size	Population Served	Proposed Rate Increase	Anticipated Growth	Ownership	Rate Increase Information on Website
Santa Fe, New Mexico	Large	67,947	41%	No	Municipal	Yes
City of North Liberty, Iowa	Large	13,374	44%	Yes	Municipal	Yes
City of Hutto, Texas	Large	14,698	59%	Yes	Municipal	Yes

The analysis of the communication strategies of these water systems offers a contribution to the previous research that has been performed on value of water communication (Personal Communication, Michigan State University, 2014).

Santa Fe, New Mexico

The Sangre de Cristo Water District supplies drinking water to approximately 32,000 water customers within Santa Fe, New Mexico. The city has a population of 67,947 people (U.S. Census Bureau, 2010). The water system proposed to increase water rates by 8.2 percent each year for a period of five years. Together this totaled a 41 percent water rate increase. Santa Fe's City Council adopted an ordinance to approve the rate increase and it was implemented in 2009.

Communication to Customers

The water system explained the need for this increase on multiple webpages within the official City of Santa Fe website. One of the webpages was dedicated to how the rate increases will fund the construction of Buckman Direct Diversion (BDD), a new project to add a new water source as well as fund overall improvements to the Water District's existing infrastructure, including upgrades to the Canyon Road Water Treatment Plant and reservoirs and rehabilitation

of existing wells and other assets (City of Santa Fe, 2013c). A Frequently Asked Questions webpage included questions such as "What would happen to the utility if the rates were not adjusted?" and "Is the BDD necessary?" Another webpage described the BDD in more detail and its inclusion in the city's Long Range Water Supply Plan. It described the new BDD project as being reliable, redundant, and sustainable as it will help alleviate groundwater withdrawals. In addition, information was provided on water conservation and the incentives that the water system was offering for residents to install water efficient appliances (City of Santa Fe, 2013d). Another webpage provided an example of how each annual rate increase would affect an average residential, small commercial, and large commercial bill (Figure 6). A typical residential household's monthly bill prior to the increase is $31.50 per month and ends at $46.70 per month in the fifth year of the rate increase (City of Santa Fe, 2013b).

Residential 5/8" (4/6 Kgals)	
Existing	$31.50
1st Year (2009)	$34.10
2nd Year (2010)	$36.90
3rd Year (2011)	$39.90
4th Year (2012)	$43.20
5th Year (2013)	$46.70
Small Commercial 3/4" (66/94 Kgals)	
Existing	$1,030.00
1st Year (2009)	$1,114.50
2nd Year (2010)	$1,205.90
3rd Year (2011)	$1,304.70
4th Year (2012)	$1,411.70
5th Year (2013)	$1,527.50
Large Commercial 1 1/2" (246/276 Kgals)	
Existing	$4,091.00
1st Year (2009)	$4,426.50
2nd Year (2010)	$4,789.40
3rd Year (2011)	$5,182.20
4th Year (2012)	$5,607.10
5th Year (2013)	$6,066.90

Figure 6 - Average monthly water bill with 8.2% increase (example). Courtesy of City of Santa Fe.

A flyer was available for electronic download in both English and Spanish explaining the need for a rate increase as 1) establishing a reliable water supply and 2) maintaining and operating the current water system. The flyer includes a section of how much more customers should expect to have to pay each month and provides some tips on conservation measures that individual customers can undertake to reduce costs. It's unclear if the flyer was also mailed to consumers or otherwise distributed in hardcopy (City of Santa Fe, 2013d).

City of North Liberty, Iowa

North Liberty is a city in Johnson County, Iowa that has a population of 13,374 people and about 6,600 water customers (2010 Census). The city's population has nearly doubled over the last six years and is considered one of the fastest growing cities in Iowa. The city proposed a rate increase at both their water (12 percent increase) and wastewater (8 percent increase) systems due to increasing state and federal regulations, operational expenses, and findings from their long range capital project planning. The water rate increase was approved and implemented in July 2012 (City of North Liberty, 2013a).

Communication to Customers

The City of North Liberty primarily communicated the need for the rate increases through the *Water Rate Ordinance Update Factsheet*. This factsheet was created to describe the upcoming capital improvement projects needed to repair and replace infrastructure and an example bill based on the new rates. This factsheet is available on the City of North Liberty's website and provided at City Council public meetings.

North Liberty has a Water Facilities Plan that helps to determine the upcoming capital projects that the water system needs in order to continue to provide safe drinking water to the city residents. The factsheet described the water system assets and the cost needed for their

repair, rehabilitation, or replacement determined from the Water Facilities Plan. The five year projected capital costs are approximately $2,000,000. These included removing water tower #1 ($55,000), repainting water tower #2 ($355,000), replacing and installing a water main ($800,000), purchasing generators for the wells ($165,000), increasing water testing ($15,000/year), and well electricity costs ($12,000/year).

In addition the factsheet showed examples of how the rate increases would affect average customer bills based on a utility rate analysis. This analysis showed that the base rate will increase by $1.37 to $12.81 and the rate for every 1,000 gallons of water used will increase by 51 cents to $4.79. If a family typically consumed 5,000 gallons of water per month, their monthly water bill would be $36.77, an increase of $3.94 (Figure 7).

FY 13 Water Rate Increase Analysis

	FY 12	FY 13	Difference	
Base Rate	$11.44	$12.81	$1.37	
Rate/1000	$4.28	$4.79	$0.51	
Consumption	**FY 12 Monthly Cost**	**FY 13 Monthly Cost**	**% Increase**	**$ Increase**
3,000	$24.27	$27.19	12.00%	$2.91
5,000	$32.83	$36.77	12.00%	$3.94
8,000	$45.66	$51.14	12.00%	$5.48
11,000	$58.50	$65.52	12.00%	$7.02

Figure 7 - FY13 water rate increase analysis. Courtesy of City of North Liberty.

The factsheet contained a ledger of the annual budgeted expenditures and revenues that the water system has seen and expects to see in the future. The revenue generated from the rate increases is factored in to show how future capital expenditures will be spent. The other revenues that the system generates other than water sales includes those from sales tax and

connection fees. The expenses show that funds are needed for water system staff salaries, to repay existing debts such as loans, and to go into a capital reserve fund. The system is also planning for a future new water system that they hope to construct by 2020. The estimated cost for this new water system will be about $17,000,000 (City of North Liberty, 2013b).

The public was invited to attend and comment on the proposed increases at three separate hearings that the City Council held to read the proposed ordinance. Each hearing was held at 7:00pm at City Hall. A webpage was also developed on the City of North Liberty's website where residents could submit comments electronically (City of North Liberty, 2013c).

City of Hutto, Texas

Hutto is a city in Williamson County, Texas with a population of 14,698 people serving approximately 4,200 water connections (2010 Census). The city has experienced a large amount of growth over the past 10 years as the 2000 Census indicated a population of just 1,250 residents. The water system proposed a rate increase of 59 percent over a 5 year period in early 2013 to address supply, treatment, delivery, repair and maintenance, and capital expenses associated with expanding capacity to meet growth demands. However, the City Council elected to approve an increase of 15 percent over one year effective June 1, 2013 (City of Hutto, 2013a).

A utility rate study was performed to fulfill the city's Local Government Code requirement of conducting a rate study every five years to assess the water system's revenue structure. The rate study included information on the sources that the City of Hutto's water comes from, the contract agreements that secure use of water for the community, and the capital improvement projects that need to be undertaken primarily in fiscal year (FY) 2014 and FY2015 to maintain the system and accommodate growth. Upcoming projects totaling $2,785,000

including installing 12" and 16" waterline, initiating a waterline replacement program, and developing a water master plan.

The rate study suggested that 2014 have a 30 percent increase, 2015 have a 20 percent increase, and 2016 – 2018 each have a three percent increase, bringing the total water rate increase to 59 percent over five years (Figure 8). The City Council voted to only implement a 15 percent water rate increase for the FY2014 year to evaluate the impact that this increase would have on customers as well as on the water utility budget (City of Hutto, 2013a).

CITY OF HUTTO Average Monthly Bill Comparison - 7,000 Gallons Water Consumption/5,000 Gallons of WW Consumption							
		2013	2014	2015	2016	2017	2018
WATER							
Projected rate increase over prior year			30.0%	20.0%	3.0%	3.0%	3.0%
Residential	5/8" meter	$ 60.41	$ 78.51	$ 94.20	$ 97.04	$ 99.96	$ 102.99
Non-residential	1" meter	$ 72.63	$ 94.41	$ 113.30	$ 116.72	$ 120.25	$ 123.90
WASTEWATER							
Projected rate increase over prior year			4.0%	3.9%	3.1%	3.0%	3.0%
Residential winter avg	5/8" meter	$ 37.72	$ 39.24	$ 40.79	$ 42.03	$ 43.29	$ 44.57
Residential flat rate	5/8" meter	$ 40.00	$ 41.60	$ 43.26	$ 44.56	$ 45.90	$ 47.28
Non-residential	1" meter	$ 50.26	$ 52.26	$ 54.34	$ 55.99	$ 57.67	$ 59.42
COMBINED							
Projected rate increase over prior year			20.0%	14.6%	3.0%	3.0%	3.0%
Residential	5/8" meter	$ 98.13	$ 117.75	$ 134.99	$ 139.07	$ 143.26	$ 147.56
Non-residential	1" meter	$ 122.89	$ 146.66	$ 167.64	$ 172.72	$ 177.92	$ 183.31

Figure 8 - Average monthly bill comparison. Courtesy of City of Hutto.

Communication to Customers

The Mayor's office posted information on their blog in April 2013 to describe how the 15 percent rate increase is needed to pay for infrastructure costs, maintenance of the system, and water treatment, and pumping. The mayor provided the reason for the rate increase being due to long-term water contracts that will ensure water will continue to be available to the City's rapidly growing population. Contact information for a staff person in the Mayor's Office was provided to answer questions from the general public (City of Hutto, 2013b).

Summary of Communication Messages

The three water systems used a variety of strategies to communicate to their customers the need to increase water rates. The strategies used to convey this information included webpages, blogs, factsheets or flyers, and structured public comment opportunities (Table 5). The water systems reviewed in this analysis all used websites as part of their approach to communicate the need for rate increases. The City of North Liberty has one webpage for relaying water system information. This webpage describes the source that the city's water comes from, the capacity of the two water towers in the City, and copies of the system's annual Water Quality Reports. Additional information, including information on the proposed rate increases, is communicated through PDF documents that can be downloaded from the website. Research performed as part of the Colorado WaterWise *Value of Colorado's Water* campaign showed that water systems use websites to promote the value of water (Colorado WaterWise, 2013a). Providing information through websites allows water systems to relay the value of the water delivery service that they provide to the community and the need for rate increases to sustainably provide the service of safe drinking water.

In addition to providing information out to the public on the rate increases, one city, the City of North Liberty, invited the public to attend and comment on the proposed increases at three separate hearings held by the City Council. Each hearing was held at 7:00pm at City Hall. During these meetings the proposed ordinance was read and questions and comments were taken from the participants. Additionally, a special webpage was developed on the City of North Liberty's website where residents could submit comments on the proposed rate increase electronically.

Table 5 - Comparison of water system communication strategies

Water System	Population Served	Proposed Rate Increase	Communication Strategies Used*					Decision
			Webpage	*Blog*	*Factsheet/ Flyer*	*Public Meetings*	*Public Comment Form*	
Santa Fe, New Mexico	67,947	8.2% per year for period of five years, starting in 2009 Total = 41%	✓		✓			Proposed rate increase ***was approved***; began in 2009, last increase implemented in 2013.
City of North Liberty, Iowa	13,374	12% - 2013 8% - 2014 8% - 2015 8% - 2016 8% - 2017 Total = 44%	✓		✓	✓	✓	Proposed rate increase ***was approved***; rate increase went into effect in 2013
City of Hutto, Texas	14,698	30% - 2014 20% - 2015 3% - 2016 3% - 2017 3% - 2018 Total = 59%	✓	✓				Proposed rate increase ***was not approved***; a 15% rate increase went into effect in 2013

*Communication Strategies Used include those that had information readily available from an internet search.

The City of Hutto's inability to get their rate increase approved highlights the need for water systems to effectively communicate their needs to these decision makers before rate adjustments will be passed and before communication to customers occurs (EPA, 2006). Without the support of knowledgeable local officials and decision makers, a water system will have difficulty in operating efficiently and sustainably (U.S. EPA, 2011b).

Analysis of Communication Messages

The three water systems analyzed as part of this Masters Project did not utilize any of the value of water outreach materials within *Public Awareness and Outreach Initiatives* section of this paper or concise messages identified in

The Art of Communicating Utility Pricing section in their communication to customers on the proposed rate increases. However, they did convey information to consumers within the general themes of the recommended messages. An analysis of the communication strategies that were used and the existing Value of Water materials that could have been utilized to communicate their messages are explored below.

Communicating Effective Messages

Water delivery is a service; infrastructure is needed for treatment and delivery of water (AWWA, 2011a).

Santa Fe included a flyer for electronic download from their website that was available in both English and Spanish. The flyer was written in plain language that the public can easily understand (PLAIN, 2014). Using plain language and also having the flyer available in the two languages predominately spoken in the area likely helped to relay information on the rate increase to the public. In addition, communicating the need to continue to maintain and operate the current water system along with the system's infrastructure improvements is key in obtaining ongoing support from the customers. It is important for the general public to understand the maintenance and upkeep that is required to successfully manage a water system (AWWA, 2011a). The flyer uses this knowledge to demonstrate that their financial and capital improvement plan is sound and mentions their AAA bond rating through the Standards and Poor's Index which helps customers understand that the rate increase makes financial sense and is good for the community's future economic position.

AWWA's *Only Tap Water Delivers* campaign includes print ads and bill stuffers in both English and Spanish that can be used to convey the message of utility operation being a service performed for the City of Santa Fe (Table 3). If the City of Santa Fe is an AWWA member, the

water system managers or communication staff may find these materials helpful in communicating to their diverse customer base.

Growing populations and chronic underinvestment are putting pressure on our nation's aging water infrastructure (Xylem, 2012).

Santa Fe's webpage on the factors that go into setting the price of water contained technical information on how the water system was striving to create redundancy to ensure long-term sustainability of the water system's ability to continually provide safe drinking water. While this is an accurate statement, the general public may not readily know what the terms 'redundancy' and 'sustainability' mean. Research done for the *Value of Colorado's Water* campaign showed that Coloradan residents are unfamiliar with basic water terms (Colorado WaterWise, 2011b). Terms such as redundancy and sustainability may be even more difficult for the general public to understand. Those who work in the water industry are very familiar with these terms but the general public might not understand exactly what is meant by them without clear definitions, which were not present on the webpage. Utilizing plain language in this communication may have helped (PLAIN, 2014).

The City of Hutto has a blog that the mayor uses to write about community specific topics. One of the blog posts was written about the 15 percent water rate increase. The blog noted that water rates include the costs of infrastructure, maintenance of the system, water treatment, and pumping. The mayor provided the reason for the rate increase being due to long-term water contracts that will ensure water will continue to be available to the City's rapidly growing population. Using images of the water system staff and infrastructure within the blog would have been helpful in personalizing the water system issues with the general public (Eckl, 2014).

Materials such as WEF's two Public Service Announcements and their 100 Years bill stuffers and print ads can help explain water terms and the challenges of stresses that increased populations have on aging infrastructure that is in poor condition. While these materials are developed by a wastewater focused association, the messages contained within them are generic enough to apply to the messages also conveyed by water systems (Table 3).

Water utilities are critical to quality of life (Johnson Foundation, 2012a; SCAP, 2008; Westerhoff, 2005; Stratus Consulting, 2014).

None of the systems that were reviewed for this Project provided information on how the water systems are critical to the quality of life for all citizens living within the community. Research has shown that people generally care about their communities and care about the quality of life for themselves and their children (U.S. EPA, 1989). And in the 2010, the Value of Water Survey administered by ITT showed that 95 percent of respondents value water over any other service they receive, including electricity, heat, internet, cell phones, and cable television (Figure 3). This information should encourage water systems to communicate how they contribute to the quality of life that their customers experience on a daily basis. Images of an inconvenience that the community can relate to such as a water main break during rush hour or a disaster such as a chemical spill in a local water supply can give the general public perspective on the quality of life that water infrastructure helps them to enjoy (Personal Communication, U.S. EPA, Region 1, 2014).

Value of water materials that could be used to convey this message include AWWA's Tall Drink of Water radio PSA, WEF's Buried But Not Forgotten bill stuffer and door hanger, WEF's Lifeline Infrastructure Awareness bill stuffer, and Circle of Blue's 10 Things You Should Know About Water infographic (Table 3).

Failing infrastructure is bad news for the economy. People will leave the community if there is not a stable water infrastructure and supply (AWWA, 2004; Stratus Consulting, 2014; Navarret, 2014).

The City of North Liberty factsheets showed that for FY2013, the year that the 12 percent water rate increase went into effect, the total revenue for the water system was $2,271,140 and the total expenses for the water system were $2,258,427. It is important to show the community that the utility is developing financial forecasts for their long-term capital planning. However, missing from these line items are the funds needed for regular operation and maintenance. This information is needed so that the public understands that ongoing upkeep is needed to sustain the water system's ability to function properly (AWWA, 2004).

North Liberty could use WEF's Buried but Not Forgotten bill stuffers and door hangers to communicate the message of failing infrastructure affects the economy. While these materials are specifically geared toward wastewater systems, the City could use them to generate ideas on how this message can be marketed within their community (Table 3).

The value provided in reliable water service justifies costs (Beecher, 2011; Beecher and Chestnutt, 2012; Pacific Institute, 2013b; Stratus Consulting, 2014).

All three water systems provided examples of what average bills would look like with the proposed rate increases. Santa Fe provided examples of what the average monthly bill would be for customers under the new rate increases for each year that the rates would be increased. These average monthly costs were broken up by year (2009 – 2013) and also by customer type (residential, small commercial, and large commercial) so a customer could easily see what their total monthly cost will be. The City of Liberty provided an example water bill with the amount proposed to be increased for the base rate as well as for the consumptive rate and the difference between 2012 and 2013 prices. The example bill breaks down the dollar amount of the increase based on 3,000, 5,000, 7,000 gallons, or 10,000 gallons consumed per month (between $2.91 and

$7.02). This information is helpful in showing customers that their bills will increase only nominally each month to get buy-in for the rate increase. The factsheet did not provide dollar figures of the amount that would be increased for years 2014 – 2017. The City of Hutto's Utility Rate Study Summary gave an example average monthly bill for what residential and nonresidential customers who consume 7,000 gallons of water per month would pay under the rate increase for each of the five years where increases are proposed.

In the 2012 Value of Water Index administered by Xylem, 41 percent of respondents strongly agreed and 30 percent somewhat agreed with the statement "I am willing to pay more money each month to ensure that I continue to have access to safe, clean water" (Figure 5). Providing example bills is a good way to show customers approximately how much more they will be paying when a rate increase takes effect. While the information provided by the water systems is helpful for understanding the impact that the total increase will have on a customer's bill, it does not clearly state how these costs are justified. Utilizing materials such as AWWA's *I'm not so easily replaced* bill stuffer and Xylem's *Value of Water* PSA could be helpful in communicating how these costs are justified. Other materials that can be used to garner ideas from include American Water's *Value of Water* E-Learning Module, the Association of California Water Agencies *Water: The Best Deal Around* video and bill stuffer, and the Local Government Advisory Committee's *Sustainable Water Source Infrastructure* video and case studies (Table 3).

Water infrastructure protects public health.

The water systems did not provide much public health protection information when communicating the need for the latest rate increases. Emphasizing the safety of water within the

community is important to remind customers. Reduced risk of water borne illnesses and deaths are attributed to the great work that water systems perform on a daily basis (U.S. EPA, 2011a).

Water systems should continuously remind their customers of the work that they do to keep them safe. AWWA's *Only Tap Water Delivers* bill stuffer and print ad and WEF's *Cracks, Leaks, and Breaks don't fix themselves* bill stuffer could be helpful in providing evidence and statistics of the service water systems provide in treating water as necessary to protect the public health (Table 3).

We are responsible stewards of water resources (Beecher and Chestnutt, 2012; Stratus Consulting, 2014).

Santa Fe's *Water Rate Factors* webpage explained the different water conservation incentives that the water system was offering such as rebates for low flow toilets. Climate events such as droughts can impact short-term and long-term water availability to community water supplies. Information on conservation and using water efficiently can be an important driver in value of water communication. While conservation incentives were noted on the webpage, additional web links or contact information were not provided to access further information on how to take advantage of these incentives.

In addition to providing contact information, Santa Fe could utilize AWWA's *Do you know how often you turn me on?* and *I want to be here for you* bill stuffers and print ads to communicate the need for conservation to ensure long-term availability of safe water. In addition, WEF's PSA #3 could be used to show how investing in water infrastructure is good for the environment (Table 3).

Observations of Selected Water Systems' Communication

Local Elected Official and Decision Maker (Board, Council, etc.) Approval

Local elected officials and decision makers are responsible for making decisions for water system expenses and revenues. Water rates are a source of revenue that can pay for needed expenditures including infrastructure renewal. Local elected officials and decision making bodies such as boards, councils, etc. play a significant role in ensuring a water system's sustainable operation and that members of the community understand the challenges that water systems face. Water systems must effectively communicate their needs to these decision makers before rate adjustments will be passed and before communication to customers occurs (EPA, 2006). Many times water systems blame the public for not valuing water but many times it is the politicians that do not want to raise rates. It is not typically an issue of customer willingness to pay but rather the elected officials being willing to charge the true cost of water; and even when water systems prove the public's willingness to pay, the willingness of the elected officials to raise rates does not change (Personal Communication, New Mexico Environmental Finance Center, 2014). The national surveys administered by Xylem in 2012 show that the public cares about water and is willing to pay more in their water bills (Xylem, 2012a).

One of the water systems reviewed as part of this research did not get their proposed rate increase approved by the City Council. The City of Hutto paid a consultant $25,000 for a rate study that recommended the City to implement a 59 percent water rate increase over a 5 year period, starting with a 30 percent increase in 2014. The rate study found that nearly $750,000 was needed for infrastructure replacements in 2014 alone and over $1.8 million needed between 2015 – 2018. When the water system and the consultants presented the infrastructure needs and proposed rate increases to the City Council, the Council did not approve the increase as

recommended. Instead, the Council made a decision to approve half of the first year's proposed increase at 15 percent instead of 30 percent (City of Hutto, 2013a).

It is important for people who make the decisions to understand the risks. Many of the value of water materials can be used by water systems to market first to decision makers. Both AWWA and WEF's campaign specifically mention local elected officials and decision makers as an audience that water systems can target with the campaign materials (AWWA, 2011a; WEF, 2011k).

Lack of Knowledge of Value of Water Campaign Materials

The three water systems as part of this Master's Project did not utilize any of the value of water outreach materials described within this Project as communication approaches to explain the need for the proposed rate increases to their customers. Contributing factors that may have been factored into their lack of knowledge of the outreach may simply be an access issue. The national campaigns that have been developed by the American Water Works Association (AWWA), the Water Environment Federation (WEF), and American Water are geared to specific types of systems.

The AWWA *Only Tap Water Delivers* campaign is geared specifically toward water systems. Additionally, the only water systems that are able to access the materials must be dues paying members of AWWA. AWWA is the largest non-profit, scientific, and educational organization dedicated to water utility management and operation (AWWA, 2014a). Annual dues range from $295 for systems serving populations between 0 – 5,000 to $18,502 for systems serving populations over 150,001. Unless the water systems analyzed as part of this Master's Project are members of AWWA, they would not have access to the materials within the *Only Tap Water Delivers* campaign.

The WEF *Water is Life, and Infrastructure Makes it Happen* campaign focuses on informing the general public and elected officials on the role of water and wastewater infrastructure in delivering water to homes and businesses and in cleaning and returning it to water bodies for reuse. The materials in this campaign are available to any interested stakeholder for free download from their website (WEF, 2011k). While the messages can be used for both water and wastewater systems, some of the materials developed for the campaign contain images and information related to wastewater systems as WEF is a not-for-profit technical and educational organization that represents water quality professionals (WEF, 2014, Table 3). However, a number of the resources also include water systems as a focus. The materials are available free of charge to download from the website but unless a system is a WEF member, the system may not be aware that the materials even exist.

The American Water campaign is geared toward educating customers on the value of the water delivery service that water systems provide to them. American Water is a publicly traded company that manages and operates water and wastewater systems across the U.S (American Water, 2013). The systems that American Water operates are owned by them making the systems privately owned. The three systems analyzed as part of this research are publicly owned water systems, owned by the municipality that they serve and not a private company such as American Water. Even though the value of water information that American Water developed is publically available, public water systems would likely not be aware of their availability as they do not have a reason to regularly frequent American Water's website.

The water systems analyzed are located in New Mexico, Iowa, and Texas while the state focused Value of Water campaigns are currently located in California, Colorado, and New York. Each state with the exception of Wyoming has drinking water primacy meaning that each state

has the authority to regulate drinking water systems located in their respective state (U.S. EPA, 2012b). State drinking water program staff and drinking water associations and organizations within each state provide the main sources of information for water systems. Therefore it is unlikely that these water systems would be exposed to Value of Water materials from other states in which they are not physically located.

Lack of Marketing Materials

The water systems analyzed appear to not have had access to other professional marketing materials (e.g., graphics, videos, etc.) that could have been helpful in explaining their need for rate increases. The average annual revenue that publicly owned systems in this size category (10,000 – 100,000 population) receive each year is $3,341,898. This is a significant jump from the previous size category of serving 3,001 – 10,000 people that receives an annual average revenue of $525,298 (Table 1). This larger revenue stream is likely attributed to the system's larger customer base. The more people that the utility serves, the greater the system's economies of scale are. For this reason, and for the existence of each of the three system's websites, it can be suggested that line items for utility public outreach are contained in the water system's annual budgets. The use of pictures or images is useful in communicating messages (Eckl, 2014); neither of which were utilized by any of the three water systems researched for this Project. Considerable effort has been put into the development of the value of water materials researched for this Project and their use has the potential to benefit water systems across the country.

Recommendations for National Contributions

"If the community knows the water system is doing what they can on their end, then the system will have credibility." — Marcella Navarret, El Paso Water Utilities

While determining water rate adjustments and infrastructure improvements are largely local decisions, the U.S. EPA holds an important position as the national eyes and ears of the drinking water and wastewater sector. Recommendations on what the U.S. EPA's Office of Ground Water and Drinking Water can do to encourage further discussion on the importance of water delivery services and the costs it will take to upgrade the infrastructure that supplies that service includes hosting a national dialogue, increasing the use of social media, developing case studies, and continuing to support asset management initiatives.

National Infrastructure Investment Dialogue

There have been many campaigns that have been initiated to help water systems educate their customers on the need for reinvesting in water infrastructure. U.S. EPA holds a unique facilitation role that can gather nationwide data and share widely with interested parties. Considerable effort has been put into the development of the value of water materials researched for this Project and their use has the potential to benefit water systems across the country. Since many different organizations are developing various value of water messages for similar purposes, the federal government does not need to weigh in and develop duplicative material but could rather compile and share previously developed materials and information on a national level.

U.S. EPA should host a collaborative dialogue among water system experts to share what has already been done so that system managers can readily identify strategies and messages to

use that have been effective in communicating with customers on the need for water infrastructure investments.

These discussions will take place weekly for a 6 – 8 week timeframe. The goals of these messages should aim to:

- Help water systems learn to think more like a business by knowing their financial portfolio and planning for future capital investments.
- Increase the general public's understanding of the value, or importance, of drinking water delivery services.
- Give drinking water systems tools and approaches to effectively communicate with customers.

All water sector professionals including water associations, state drinking water staff, technical assistance providers, small, medium, and large sized water system owners and operators, academia, and any other water sector expert who is interested in participating in this discussion would be invited to attend. Additional information and a Communications Plan on preparing for these discussions are described in Appendix A. An example Op-Ed that can be used to market and bring awareness to this dialogue can be found in Appendix B. This Op-Ed is part of the Communication Plan.

National Ad Campaign

Television

U.S. EPA should develop a public service announcement (PSA) for a national television ad campaign, as resources allow. Individual states and water systems do not have the funds to develop PSAs for television. Research compiled for Colorado's Value of Water campaign showed that national advertisements would be the most effective medium to communicate the value of water to the general public. However the campaign does not have enough funding to develop PSAs and will instead develop materials to post on their website (Colorado WaterWise,

2011b). A website is essential in housing information that stakeholders can easily access but the general public typically won't go to websites unless there is a compelling reason to do so and most people won't read the mail that you send them. In addition, the rise of water systems using electronic water bills can be a problem for communicating messages that are typically found in bill inserts or bill stuffers (Personal Communication, New Mexico Environmental Finance Center, 2014).

Social Media

One communication technique that has gained popularity within the last decade is the use of social media. Utilizing a social media strategy is a way to reach people who mainly communicate via their smartphones, rather than using a computer or hardcopy, printed material approach. Water systems can use the tweets and posts written by EPA to retweet or share with their customers as a way to communicate value of water topics with their stakeholders. The main message that will be conveyed through social media outreach on the value of water topic will be that regular maintenance and replacement of our nation's drinking water infrastructure is necessary for safe drinking water.

Proper channels and processes need to be adhered to when representing federal entities over social media. The Social Media Strategy in Appendix C contains the schedule and necessary information in order to utilize social media communication techniques.

Water System Case Studies

Rate Increase Communication

The three water systems analyzed as part of this Master's Project is a small snapshot of the communication techniques used by the 52,000 community water systems across the country. While the results taken from the three individual communication strategies, the same size is not

large enough to come to a full conclusion. Additional case studies using different size categories, using systems that are located within states that have active Value of Water campaigns, systems that are AWWA or WEF members, and/or systems that are owned by American Water would provide more information on how different types of water systems are effectively communicating the need for rate increases to their customers.

Affordability

Increases in water rates will undoubtedly create hardships for certain segments of the population. A new area that could considered for federal involvement is to compile case studies on how water systems have addressed affordability issues for disadvantaged populations after implementation of steep rate increases (Personal Communication, NACWA, 2014). Further research is needed to define the scope of this potential activity but it could serve as a natural follow up action to the conclusion of the national dialogue described above.

Continued Support for Asset Management Initiatives

Continuing to support activities that encourage water systems to pursue asset management initiatives will benefit water systems by providing them with the knowledge to explain why infrastructure investments are needed and how much the investment is projected to cost. Asset management practices promote the development of Long Range Water Supply Plans used by Santa Fe, NM, Water Facilities Plans used by North Liberty, IA, and rate analyses used by Hutto, TX. If future funding and resources allow, U.S. EPA should initiate additional asset management activities including facilitating webinar trainings on developing long-range capital plans and rate studies and developing a smartphone app to replace the Check Up Program for Small Systems (CUPSS) asset management software.

Conclusion

The time has come to replace aging drinking water infrastructure for community sustainability. The effects of our nation's aging infrastructure coupled with our changing climate have heightened the urgency to reinvest in water infrastructure for many utilities over the past decade. Most of this replacement will likely have to be financed by increasing water rates.

Much of this infrastructure is located underground and its deterioration is going largely unnoticed by the general public. The local elected officials and other decision makers who approve rate increases are also largely unaware of the impending consequences that further deferment will have on their communities. Current and future investments are needed for water systems to sustain the level of service required by their communities.

Substantial educational and outreach materials have been developed for national and state level Value of Water campaigns. The research performed for the development of these resources has proven to be valid as the types of messages that water systems need to convey to their customers and decision making bodies can be effectively communicated by utilizing these materials. However, limitations can be applied for each of the campaigns with access being the strongest impediment to using the outreach materials. Many of the campaigns require membership to an association or word of mouth to obtain knowledge of the types of materials that are available. If a water system is not a member or has not heard of the materials, they do not know that they exist. Sharing these resources more widely will help overcome this accessibility obstacle.

The strategies used by the three water systems that were analyzed as part of this Project to communicate to their customers the need to increase water rates are likely similar to many other water systems across the nation. More effective messaging can be provided to the

community by utilizing the Value of Water materials that are available. Further case studies should be performed of water systems of different sizes, ownership types, and a larger sample size to verify these findings.

Water systems and water associations are taking the lead in establishing communication with their communities and best practices should be shared across the industry on how to effectively communicate the great need of repairing and replacing our nation's infrastructure. Research has shown that care should be taken in crafting effective messages that both the public and decision makers can relate to and understand. Water systems will have to build skills in these areas to ensure effective communication in order to meet their future capital goals.

References

American Society of Civil Engineers (ASCE). (2013). ASCE Drinking Water Infrastructure Report Card. Retrieved April 24, 2014 from http://www.infrastructurereportcard.org/drinking-water/

American Water. (2011a). Value of Water White Paper. Retrieved April 24, 2014 from http://www.amwater.com/files/ValueofWater_whitepaper_92711.pdf

American Water. (2011b). Value of Water Poster. Retrieved April 24, 2014 from http://www.amwater.com/learning-center/value-of-water.html

American Water. (2011c). The Value of Water E-Learning Module. Retrieved April 24, 2014 from http://amwater.com/learning-center/The-Value-of-Water-E-Learning-Course/a

American Water. (2011d). Water's Worth: Understanding the Value of Clean Water. Retrieved April 24, 2014 from http://www.amwater.com/files/WatersWorth.pdf

American Water. (2013). Our Corporate Responsibility Report: 2011-2012. Retrieved April 24, 2014 from http://www.amwater.com/corporate-responsibility/report-2011-12/downloads/full.pdf

American Water Works Association (AWWA). (2004). Avoiding Rate Shock: Making the Case for Water Rates.

American Water Works Association (AWWA). (2011a). Only Tap Water Delivers. Retrieved April 24, 2014 from http://www.awwa.org/resources-tools/public-affairs/communications-tools/only-tap-water-delivers.aspx

American Water Works Association (AWWA). (2011b). The People Behind the Water. Retrieved April 24, 2014 from http://www.drinktap.org/home/water-information/value-of-water.aspx

American Water Works Association (AWWA). (2012a). Buried No Longer: Confronting America's Water Infrastructure Challenge. Retrieved April 24, 2014 from http://www.awwa.org/Portals/0/files/legreg/documents/BuriedNoLonger.pdf

American Water Works Association (AWWA). (2012b). Only Tap Water Delivers CD. Denver, CO.

American Water Works Association (AWWA). (2014a). About Us. Retrieved April 24, 2014 from http://www.awwa.org/about-us.aspx

American Water Works Association (AWWA). (2014b). The Value of Water. Retrieved April 24, 2014 from http://www.drinktap.org/home/water-information/value-of-water.aspx

American Water Works Association Research Foundation (now known as the Water Research Foundation or WRF) and U.S. Environmental Protection Agency (U.S. EPA). (2008). Communicating the Value of Water. An Introductory Guide for Water Utilities. Retrieved April 24, 2014 from http://www.waterrf.org/PublicReportLibrary/91222.pdf

Association of California Water Agencies (ACWA). (2011a). A Public Water Agency Guide to Communicating the Value of Water to California Consumers.

Association of California Water Agencies (ACWA). (2011b). Fast Facts on Rising Water Costs. Retrieved April 24, 2014 from http://www.acwa.com/sites/default/files/post/value-water/2011/09/fast-facts-rising-water-costs.pdf

Association of California Water Agencies (ACWA). (2011c). Water: The Best Deal Around Video. Retrieved April 24, 2014 from http://www.acwa.com/content/california-water-series/californias-water-value-tap-water

Association of California Water Agencies (ACWA). (2011d).Your Tap Water – The Best Deal Around. Retrieved April 24, 2014 from http://www.acwa.com/spotlight/value-water

Association of California Water Agencies (ACWA). (2014). Value of Water: Recognizing and Using the Full Potential of Your Water Supply. Retrieved April 24, 2014 from http://www.acwa.com/spotlight/value-water

Association of California Water Agencies (ACWA) and California Department of Water Resources (CDWR). (2010). Save Our Water. Retrieved April 24, 2014 from http://www.acwa.com/spotlight/save-our-water

Atwater, R., (2014). Rate-Approval Process Communication Strategy and Toolkit: A Working Workshop and Peer-to-Peer Exchange. Presenter from Southern California Water Committee for the AWWA/WEF Utility Management Conference. February 25, 2014.

Beecher, J. (2011). Primer on Water Pricing. Institute of Public Utilities, Michigan State University. Retrieved April 24, 2014 from http://ipu.msu.edu/research/pdfs/Primer-Water-Pricing-2011.pdf

Beecher, J.A. and T.W. Chestnutt. (2012). Declining Water Sales and Utility Revenues. A Framework for Understanding and Adapting. A White Paper for the National Water Rates Summit. Alliance for Water Efficiency: Chicago, IL. August 29-30, 2012.

The Cadmus Group. (2009). Compendium of Full-Cost Pricing Issue Papers: Covering the Basics. Prepared for Peter Shanaghan, U.S. Environmental Protection Agency. Hardcopy.

Circle of Blue. (2009). Infographic: 10 Things You Should Know About Water. Retrieved April 24, 2014 from http://www.circleofblue.org/waternews/2009/world/infographic-ten-things-you-should-know-about-water/

City of Hutto. (2013a). Executive Summary Utility Rate Study 2013 – 2018. Retrieved April 24, 2014 from http://www.huttotx.gov/DocumentCenter/View/4605

City of Hutto. (2013b). Mayor's Blog – Utility Rate Study. Retrieved April 24, 2014 from http://huttomayor.wordpress.com/

City of Hutto. (2014). Water. Retrieved April 24, 2014 from http://www.huttotx.gov/index.aspx?nid=164

City of North Liberty. (2013a). About Us. Retrieved April 24, 2014 from http://northlibertyiowa.org/about-us/

City of North Liberty. (2013b). Water Rate Ordinance Update. Retrieved April 24, 2014 from http://northlibertyiowa.org/wp-content/uploads/2012/04/04-24-2012/11-Water-Rate.pdf

City of North Liberty. (2013c). Water and Sewer rates considered by council. Retrieved April 24, 2014 from http://northlibertyiowa.org/2012/04/19/water-and-sewer-rates-considered-by-council/

City of Santa Fe. (2013a). Water Rate Increases. Retrieved April 30, 2013 from http://www.santafenm.gov/faq.aspx?searchTerms=&TID=73

City of Santa Fe. (2013b). 8.2% for a Safe and Sustainable Water Future. Retrieved April 30, 2013 from http://www.santafenm.gov/index.aspx?NID=1666&ART=3309&admin=1

City of Santa Fe. (2013c). In January Water Rates are Rising. Retrieved April 30, 2013 from http://www.santafenm.gov/DocumentCenter/View/39230

City of Santa Fe. (2013d). Water Rate Factors. Retrieved April 30, 2013 from http://www.santafenm.gov/index.aspx?NID=1665

Colorado WaterWise. (2011a). Scope of Work for a Statewide Water Awareness Campaign Communications Plan. Retrieved April 24, 2014 from http://coloradowaterwise.org/Resources/Documents/Committees/Value%20of%20Water%20Campaign/CWCB%20FINAL%20SOW%20Awareness%20Campaign%203-2-11.pdf

Colorado WaterWise. (2011b). Colorado's Water Future: A Communications Roadmap for Enhancing the Value of Water. Prepared by GBSM for the Colorado Water Conservation Board. Retrieved April 24, 2014 from http://coloradowaterwise.org/Resources/Documents/CWCB_Report_FINAL_7-1-11.pdf

Colorado WaterWise (2013a). Scope of Work: The "Value of Colorado's Water" Communications Toolkit. Retrieved April 24, 2014 from http://coloradowaterwise.org/Resources/Documents/VOW%20SCOPE%20OF%20WORK_Final.pdf

Colorado WaterWise. (2013b). The "Value of Colorado's Water" Communication Toolkit: Kick-off Sponsorship Opportunities. Retrieved April 24, 2014 from http://coloradowaterwise.org/Resources/Documents/VOW%20Sponsor%20Packet.pdf

Colorado WaterWise. (2013c). Value of Water Campaign Messaging Theme Options. Retrieved April 24, 2014 from http://coloradowaterwise.org/Resources/Documents/ValueOfWaterCampaignThemes.pdf

Congressional Research Service (CRS). (2010). Water Infrastructure Needs and Investment: Review and Analysis of Key Issues. Retrieved April 24, 2014 from http://www.fas.org/sgp/crs/homesec/RL31116.pdf

Congressional Research Service (CRS). (2013). Environmental Protection Agency (EPA): Appropriations for FY2013. Retrieved April 24, 2014 from http://www.fas.org/sgp/crs/misc/R42520.pdf

Eckl, E. (2014). Water Words that Work Workshop. March 27, 2014. Water Words that Work, LLC.

Environmental Finance Center, Syracuse University. (2014). Water and Wastewater Education and Outreach Committee (WWEOC). Retrieved April 24, 2014 from http://efc.syracusecoe.org/efc/sub.html?skuvar=251

Giardina, R. (2014). Rate-Approval Process Communication Strategy and Toolkit: A Working Workshop and Peer-to-Peer Exchange. Presenter from Raftelis Financial Consultants for the AWWA/WEF Utility Management Conference. February 25, 2014.

Harold, A. (2013). Presenter from the Colorado Department of Public Health and the Environment (CDPHE) for the U.S. EPA National Capacity Development and Operator Certification Workshop. November 2014.

H2O Radio. Retrieved April 24, 2014 from http://www.h2oradio.org/index.html

ITT Corporation. (2010). Value of Water Survey. Retrieved April 24, 2014 from http://www.xyleminc.com/valueofwater/media/ITT%20Value%20of%20Water%20Survey.pdf

The Johnson Foundation. (2012a). Declining Water Sales and Utility Revenues: A Framework for Understanding and Adapting. Summary form the National Water Rates Summit, Racine WI. August 2012.

Local Government Advisory Committee (LGAC) Sustainable Water Infrastructure Video and Case Studies. (2007). Retrieved April 24, 2014 from http://water.epa.gov/infrastructure/sustain/lgac_video_index.cfm

Mastracchio, J. (2014). Rate-Approval Process Communication Strategy and Toolkit: A Working Workshop and Peer-to-Peer Exchange. Presenter from ARCADIS for the AWWA/WEF Utility Management Conference. February 25, 2014.

Morgan, K. (2012). Managing Water Main Breaks Field Guide. American Water Works Association (AWWA). Denver, CO.

Navarret, M. (2014). Rate-Approval Process Communication Strategy and Toolkit: A Working Workshop and Peer-to-Peer Exchange. Presenter from El Paso Water Utilities for the AWWA/WEF Utility Management Conference. February 25, 2014.

New York State Department of Health (NYSDH). (2013). The Value of Water: What's it worth to you and your community? Retrieved April 24, 2014 from https://www.health.ny.gov/environmental/water/drinking/docs/value_of_water.pdf

The Pacific Institute. (2013a). An Overview of the "New Normal" and Water Rate Basics. Retrieved April 24, 2014 from http://pacinst.org//wp-content/uploads/sites/21/2013/06/pacinst-new-normal-and-water-rate-basics.pdf

The Pacific Institute. (2013b). Water Rates: Communication and Education. Retrieved April 24, 2014 from http://www2.pacinst.org/reports/water_rates/communication_and_education.pdf

Personal Communication, Anonymous. (2014a). Michigan State University. February 2014.

Personal Communication, Anonymous. (2014b). National Association of Clean Water Agencies (NACWA). March 2014.

Personal Communication, Anonymous. (2014c). New Mexico Environmental Finance Center. April 2014.

Personal Communication, Anonymous. (2014d). New York State Department of Health (NYSDH). March 2014.

Personal Communication, Anonymous. (2014e). U.S. Environmental Protection Agency (U.S. EPA) Region 1. April 2014.

PLAIN. (2014). What is Plain Language? Retrieved April 24, 2014 from http://www.plainlanguage.gov/whatisPL/

Raucher, K. (2014). Rate-Approval Process Communication Strategy and Toolkit: A Working Workshop and Peer-to-Peer Exchange. Presenter from Stratus Consulting for the AWWA/WEF Utility Management Conference. February 25, 2014.

Raucher, R. (2014). Rate-Approval Process Communication Strategy and Toolkit: A Working Workshop and Peer-to-Peer Exchange. Presenter from Stratus Consulting for the AWWA/WEF Utility Management Conference. February 25, 2014.

Saad, L. (2009). Water Pollution Americans' Top Green Concern. Gallop Poll. Retrieved April 24, 2014 from http://www.gallup.com/poll/117079/water-pollution-americans-top-green-concern.aspx#1

Shanaghan, Peter E. (2012). Assessing Drinking Water Infrastructure Need. Journal AWWA. Retrieved April 24, 2014 from http://www.awwa.org/publications/journal-awwa/abstract/articleid/32633464/issueid/33575583.aspx?getfile=/documents/dcdfiles/32633464/waternet.0076386.pdf

Southern California Alliance of Publicly Owned Treatment Works (SCAP). (2008). Building the Wastewater Utility Brand: Practical Advice for Increasing Trust, Support, and Investment. Retrieved April 24, 2014 from http://utilitybranding.net/pdfs/BrandingManualFINALPDF.pdf

Stratus Consulting, Inc. Messages for Rate Setting. Rate Approval Process Communication Strategy and Toolkit: A Working Workshop and Peer-to-Peer Exchange. Background material provided the AWWA/WEF Utility Management Conference. February, 25, 2014.

Tiger, M. (2014). WaterOpolis – The Value of Water Issues & Choices Utility Budgeting Simulation. Presenter from UNC Environmental Finance Center for the AWWA/WEF Utility Management Conference. February 25, 2014.

The Texas Economy. (2013). Public Water Supply Conditions. Retrieved April 24, 2014 from http://www.thetexaseconomy.org/natural-resources/articles/article.php?name=mapWaterSupply

Texas Water Development Board (TWDB). (2013). Water IQ: Know Your Water. Retrieved April 24, 2014 from http://www.wateriq.org/

Texas Water Smart. Retrieved April 24, 2014 from http://texaswatersmart.com/

U.S. Census Bureau. (2010). State & County QuickFacts. Retrieved April 24, 2014 from http://quickfacts.census.gov/qfd/index.html

U.S. Environmental Protection Agency (U.S. EPA). (1989). Building Support for Increasing User Fees. Retrieved April 24, 2014 from http://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=00000KO7.txt

U.S. Environmental Protection Agency (U.S. EPA). (2006). Talking To Your Decision Makers: A Best Practices Guide. Retrieved April 24, 2014 from

http://www.epa.gov/ogwdw/smallsystems/pdfs/guide_smallsys_decision_makers_08-25-06.pdf

U.S. Environmental Protection Agency (U.S. EPA). (2009). 2006 Community Water System Survey. Retrieved April 24, 2014 from http://water.epa.gov/infrastructure/drinkingwater/pws/upload/cwssreportvolumeI2006.pdf

U.S. Environmental Protection Agency (U.S. EPA). (2011a). Aging Water Infrastructure Research: Addressing the Challenge through Science and Innovation. Retrieved April 24, 2014 from http://nepis.epa.gov/Adobe/PDF/P100EQ6Q.pdf

U.S. Environmental Protection Agency (U.S. EPA). (2011b). Lessons Learned: Effective Utility Management. Retrieved April 24, 2014 from http://www.amwa.net/galleries/default-file/EUM_Lessons_Learned_Dec%20%202011_FINAL.pdf

U.S. Environmental Protection Agency (U.S. EPA). (2011c). Re-Energizing the Capacity Development Program: Findings and Best Practices from the Capacity Development Re-Energizing Workgroup. Retrieved April 24, 2014 from http://water.epa.gov/type/drink/pws/smallsystems/upload/re-energizing_april-2011_508_compliant_final_v3.pdf

U.S. Environmental Protection Agency (U.S. EPA). (2012a). Infrastructure Financing & the Price of Water Services. Retrieved April 24, 2014 from http://water.epa.gov/infrastructure/sustain/financing_priceofwater.cfm

U.S. Environmental Protection Agency (U.S. EPA). (2012b). Primacy. Retrieved April 24, 2014 from http://water.epa.gov/infrastructure/drinkingwater/pws/primacy.cfm

U.S. Environmental Protection Agency (U.S. EPA). (2013a). Drinking Water Infrastructure Needs Survey and Assessment. Retrieved April 24, 2014 from http://water.epa.gov/grants_funding/dwsrf/upload/epa816r13006.pdf

U.S. Environmental Protection Agency (U.S. EPA). (2013b). Long-term Planning for Sustainable Water and Wastewater Infrastructure in Wellpinit, Washington, for the Spokane Tribe of Indians. Appendix F. Retrieved April 24, 2014 from http://www.epa.gov/smartgrowth/pdf/spokane-tribe-water-planning.pdf

U.S. Environmental Protection Agency (U.S. EPA). (2013c). Water Audits and Water Loss Control for Public Water Systems. Retrieved April 24, 2014 from http://water.epa.gov/type/drink/pws/smallsystems/upload/epa816f13002.pdf

U.S. Environmental Protection Agency (U.S. EPA). (2013d). WaterSense. 2012 WaterSense Program Accomplishments. Retrieved April 24, 2014 from http://www.epa.gov/watersense/docs/ws_accomplishments2012_508.pdf

U.S. Environmental Protection Agency (U.S. EPA). (2014a). Public Drinking Water Systems: Facts and Figures. Retrieved April 24, 2014 from http://water.epa.gov/infrastructure/drinkingwater/pws/factoids.cfm

U.S. Environmental Protection Agency (U.S. EPA). (2014b). Reference Guide for Asset Management Tools: Asset Management Plan Components and Implementation Tools for Small and Medium Sized Drinking Water and Wastewater Systems. Prepublication Draft Version.

The Value of Water Coalition. (2013). Retrieved April 24, 2014 from http://thevalueofwater.org

Vidra, R. (2013). Environmental Communication Planning. Executive Education Course. September – November 2013.

Water Environment Federation (WEF). (2011a). 100 Years Bill Stuffer. Retrieved April 24, 2014 from http://www.wef.org/uploadedImages/Public_Information/Water_Quality_Professionals/Water_is_Life,_and_Infrastructure_Makes_it_Happen/Toolkit/100_Years_Stffr_SMPL.jpg?n=2484

Water Environment Federation (WEF). (2011b). 100 Years Print Ad. Retrieved April 24, 2014 from http://www.wef.org/PublicInformation/page.aspx?id=919

Water Environment Federation (WEF). (2011c). Buried But Not Forgotten Bill Stuffer. Retrieved April 24, 2014 from http://www.wef.org/uploadedImages/Public_Information/Water_Quality_Professionals/Water_is_Life,_and_Infrastructure_Makes_it_Happen/Toolkit/BuriedStffr_SMPL.jpg?n=4022

Water Environment Federation (WEF). (2011d). Buried But Not Forgotten Door Hanger. Retrieved April 24, 2014 from http://www.wef.org/uploadedImages/Public_Information/Water_Quality_Professionals/Water_is_Life,_and_Infrastructure_Makes_it_Happen/Toolkit/BuriedStffr_SMPL.jpg?n=4022

Water Environment Federation (WEF). (2011e). Cracks, Leaks, and Breaks don't fix themselves Bill Stuffer. Retrieved April 24, 2014 from http://www.wef.org/uploadedImages/Public_Information/Water_Quality_Professionals/Water_is_Life,_and_Infrastructure_Makes_it_Happen/Toolkit/CracksLeaks_Stffr_SMPL.jpg?n=6781

Water Environment Federation (WEF). (2011f). The Infrastructure Beneath Our Feet Schematic. Retrieved April 24, 2014 from http://www.wef.org/PublicInformation/page.aspx?id=670

Water Environment Federation (WEF). (2011g). Lifeline Infrastructure Awareness Bill Stuffer. Retrieved April 24, 2014 from

http://www.wef.org/uploadedImages/Public_Information/Water_Quality_Professionals/Water_is_Life,_and_Infrastructure_Makes_it_Happen/Toolkit/Lifeline_Stffr_SMPL.jpg?n=9416

Water Environment Federation (WEF). (2011h). PSA #1. Retrieved April 24, 2014 from http://www.wef.org/PublicInformation/page.aspx?id=914

Water Environment Federation (WEF). (2011i). PSA #2. Retrieved April 24, 2014 from http://www.wef.org/PublicInformation/page.aspx?id=915

Water Environment Federation (WEF). (2011j). PSA #3. Retrieved April 24, 2014 from http://www.wef.org/PublicInformation/page.aspx?id=916

Water Environment Federation (WEF). (2011k). Water is Life, Infrastructure Makes It Happen. Retrieved April 24, 2014 from http://www.wef.org/wil/

Water Environment Federation (WEF). (2014). About WEF. Retrieved April 24, 2014 from http://www.wef.org/about/

Water Research Foundation (WRF) and The Cadmus Group. (2012). Report on the Operational and Economic Impacts of Hurricane Irene on Drinking Water Systems. Retrieved April 24, 2014 from http://www.waterrf.org/resources/Lists/PublicSpecialReports/Attachments/6/Hurricane_Irene_Survey_Report.pdf

Westerhoff, G.P., H. Pomerance, and D. Sklar. (2005). "Envisioning the future water utility." Journal AWWA, 97(11):67-74.

Xylem. (2012a). Value of Water Index. Retrieved April 24, 2014 from http://www.xyleminc.com/valueofwater/index.html

Xylem. (2012b). Report Background. Retrieved April 24, 2014 from http://www.xyleminc.com/valueofwater/media/2012_Value_of_Water_Index_Highlights.pdf

Xylem. (2012c). Value of Water Infographic. Retrieved April 24, 2014 from http://www.xyleminc.com/valueofwater/media/2012_Value_of_Water_Infographic_8.5x11.pdf

Xylem. (2012d). Value of Water Public Service Announcement (PSA). Retrieved April 24, 2014 from http://www.youtube.com/watch?v=iRwywNan9Ec

Young, D. (2013). (2013). Presenter from the Texas Commission on Environmental Quality (TCEQ) for the U.S. EPA National Capacity Development and Operator Certification Workshop. November 2014.

Appendix A: Communication Plan for National Discussion Group to Create Public Awareness of Water Infrastructure Needs

Creating Awareness of Water Infrastructure Needs

Communication Plan

Background

Safe drinking water is essential for healthy and thriving communities. Much of the water infrastructure that delivers this important resource to our homes and business is aging and in need of repair and replacement. In fact, the majority of our nation's extensive drinking water pipe network system was installed over 50 years ago and nearly a century ago in some older metropolitan cities.[1] As a result, many communities are experiencing challenges with costly water main breaks and inconvenient service disruptions. Infrastructure is expensive and much of the costs needed for infrastructure improvements will come directly from customers of water systems through the fees or user rates charged for their water usage. However, many rate payers resist increases in their water bills and water systems have traditionally found it difficult to raise rates to pay for needed future capital investments.[2] This communication plan will focus on messages that the water sector can use to communicate the need for rate increases to cover these costs.

Goals

The goals of these messages will aim to:

- Help water systems learn to think more like a business by knowing their financial portfolio and planning for future capital investments.
- Increase the general public's understanding of the value, or importance, of drinking water delivery services.
- Give drinking water systems tools and approaches to effectively communicate with customers.

[1] American Water Works Association. Buried No Longer: Confronting America's Water Infrastructure Challenge (2012). Retrieved from http://www.awwa.org/Portals/0/files/legreg/documents/BuriedNoLonger.pdf

[2] American Water. Value of Water White Paper (2011). Retrieved from http://www.amwater.com/files/ValueofWater_whitepaper_92711.pdf

Key Messages and Themes

To achieve these goals, messages have to be clear, concise, and compelling. The themes of these messages will focus on three main points:

- Drinking water delivery is a service that community water systems provide.
- Our nation's water infrastructure is reaching the end of its useful life.
- Repairing and replacing infrastructure will require major investments, much of which the communities that are served will have to pay for.

Stakeholder Analysis

While these messages will be targeted to drinking water systems, the messages are intended to reach the water sector professionals who work directly with these drinking water systems. Professionals from water sector associations and technical assistance provider organizations have established relationships with drinking water systems and will have credibility in relaying the intended messages. Other stakeholders that the messages will be aimed toward are elected officials, governors associations, state drinking water programs, and state health departments.

Communication Strategies

The mode of communication will focus on three channels.

1. Creating a stakeholder group to foster dialogue among water sector professionals
2. Writing an Op-Ed to bring awareness to infrastructure cost needs and recruit participation in the stakeholder group
3. Developing social media posts on infrastructure cost needs and communication strategies to OW Press Office to bring awareness to the issues

Table 6 - Communication strategies summary

Strategy	Purpose	Targeted Stakeholders	Tactics/Means for Implementation	Timeframe
Create a stakeholder group to foster dialogue	*Develop best practices in effective communication from water systems to customers*	• State staff • Water association staff • TA providers • Water system staff	• Flyer • Email over existing CUPSS listserve • Email to Regional Capacity Development Coordinators • Blog on CapCert Connections	Begin dialogue in April 2014; meet once a week for 8 weeks
Publish an Op-Ed	*Gain awareness of the issue; also solicit participation in the workgroup*	• EPA staff • State staff • Water systems	• Send to EPA Office of Water to include in the monthly Water News newsletter • Send to state Capacity Development coordinators to include in their operator focused state newsletters	Begin distributing in April 2013
Develop social media posts and communication strategies to send to the OW Press Office	*Gain broader awareness of the issue of aging infrastructure; get the attention of interested stakeholders*	• General public • Water associations • Water systems	• Prepare a few standard posts • Have stakeholder group members develop a message after each meeting	April – June 2014

Strategy #1: Create a stakeholder group to foster dialogue among water professionals

Tap Talks on Tuesdays

Timeframe: Meetings will begin in May 2014 and group will meet weekly for 6-8 weeks.

This strategy's main intent is to identify best practices in effective communication that water systems can use in explaining rate increases to their customers. The targeted stakeholders for this group will include those who work closely with water systems such as state drinking water program staff, water and community association staff, and technical assistance providers from non-profit organizations. Water system staff that have strong communication skills will also be welcome. It's important to include these stakeholders as they are 'on the ground' working with water systems are a daily basis. This approach will help with establishing buy-in for this EPA led effort. Also, their credibility with water systems will help in disseminating information on communication best practices at a future date.

Recruitment for participation in this dialogue will include preparing a flyer announcing the issue and need for a discussion group. Interested participants will be asked to sign up for "Tap Talks on Tuesdays" to join in the dialogue. Other recruitment mechanisms will include sending emails over existing listserves that contain state staff, technical assistance providers, and water systems interested in asset management practices, emails sent to the EPA Regional Capacity Development Coordinators, and blog posts on CapCert Connections which is geared toward state and technical assistance staff. In addition, an Op-Ed will be prepared for recruitment, and also to bring awareness to the issue in general. A detailed approach for publishing an Op-Ed is Strategy #2.

Strategy #2: Publish an Op-Ed

Infrastructure Cost Conversations

Timeframe: Begin distributing in early April 2014

The purposes of this strategy are to raise awareness of the need for capital improvement expenditures to repair and replace aging infrastructure and to also solicit participation in the stakeholder group described in Strategy #1. The targeted audience for this Op-Ed will be EPA staff, state drinking water staff, and water systems. This Op-Ed will be distributed to the Office of Water to include in the monthly Water Headlines email newsletter. It will also be distributed to state Capacity Development coordinators to include in their operator focused state newsletters that are generally published on a quarterly basis.

The Op-Ed titled *Infrastructure Cost Conversations* is included in Appendix B.

Strategy #3: Develop social media posts and communication strategies to send to the Office of Water's Press Office

Like, Share, and Reply!

Timeframe: Begin posting to social media accounts in May 2014.

The Office of Water's Press Office maintains two social media accounts, the 'EPA - Water Is Worth It' Facebook page and the 'U.S. EPA Water' Twitter account. This strategy focuses on preparing tweets and Facebook posts for the Office of Water Press Office to send out through these accounts. The purpose of this strategy is to use these newsfeeds to gain a broader awareness of the issue of aging infrastructure to a segment of the general public and also to get the attention of interested stakeholders within the water sector who follow or like these accounts.

The targeted audience for this messaging is the general public (those who are interested in water issues and subscribe to these accounts), as well as water associations and water systems who are interested in EPA's priorities and subscribe to these accounts.

The development of these messages will come from the stakeholder group described in Strategy #1. Tweets and Facebook posts will be developed based on the discussions from each of the weekly meetings. Detailed information on the social media strategy is in Appendix B.

Action Plan

The Strategies described within this plan depend on the success of each other and will be implemented sequentially. The planned schedule will begin in November 2013 and run through June 2014. The actions needed for successful implementation of this plan are listed in (Table 7).

Table 7 - Action Plan summary

Month	Action
November 2013:	**Strategy #1:** Get approval for stakeholder discussion group **Strategy #2:** Write Op-Ed
December 2013:	
January 2014:	
February 2014:	**Strategy #1:** Develop flyer **Strategy #1:** Prepare blog posts to recruit for stakeholder discussion group
March 2014:	**Strategy #1:** Get flyer approved

	Strategy #1: Send out emails to listserves to recruit for stakeholder discussion group **Strategy #3:** Meet with the Office of Water's Communication Office
April 2014:	**Strategy #1:** Send out flyer to recruit for stakeholder discussion group **Strategy #2:** Start distributing Op-Ed to raise awareness and recruit for stakeholder group
May 2014:	**Strategy #1:** Hold stakeholder discussion group meetings **Strategy #3:** Prepare Tweets and FB posts for Drinking Water Week (May 5 – 9, 2014)
June 2014:	**Strategy #1:** Develop recommendations identified from stakeholder discussion group **Strategy #3:** Prepare Tweets and FB posts based on "Tap Talks" discussions

Assessment/Evaluation

Success of the strategies identified in the Action Plan shown in Table 7 will be evaluated upon completion of that strategy's action. For example, **Strategy 1** will be assessed by the number of people who participate in the stakeholder group but also by the level of inquiries about the issue of aging infrastructure to the Office of Ground Water and Drinking Water's Drinking Water Hotline and questions asked of the Office Director during conference keynote speeches. **Strategy 2** will be assessed based on the number of publications that publish the Op-Ed, the number of people that participate in the stakeholder group as a result of reading the Op-

Ed, and if people inquire about the issue of aging infrastructure. The assessment of **Strategy 3** is described in Appendix B.

Outputs such as qualitative results will be measured within each action and will be used to make changes to that strategy to make it more effective. For example, looking at the number of people who like a post or favorite a tweet will help inform the validity of the subject matter to the audience such as if the audience responds positively to a particular approach that is utilized such as using an infographic or picture to convey a message. Outcomes such as the Office Director being asked a question on financing infrastructure improvements or the challenges communities face when trying to raise rates can be longer-term results and will likely be measured after the actions of the strategy have concluded.

The biggest evaluation of this effort will come from continued Office support for this project in the next fiscal year. Success will measured through the dedication of funding or other resources to this project in Fiscal Year 2014 or 2015.

Appendix B: Op-Ed

Prepared for print in *EPA's Water Headlines newsletter and state drinking water specific publications such as Washington's Water Tap, Minnesota's WaterLine , and Florida's The Floridian newsletters.*

Infrastructure Cost Conversations

You had a feeling it would be this bad. It seems like every time you turn on the news there's another story airing, another break during rush hour. That's when it hits you. It's not just here, it's not just in that other town but *drinking water infrastructure across our nation is falling apart.*

Our nation's drinking water infrastructure received a "D" on the American Society of Civil Engineers (ASCE) 2013 Infrastructure Report Card. Have you ever brought home a report card with a D? We simply can't allow our country too either, especially when we work so hard to help our water systems be sustainable.

We need your help.

Nearly everything requires maintenance, including the equipment that works to make water safe to drink and the pipes that carry it to our homes and businesses. These assets are important and should be taken care of like everything else we value.

The fact is major investment is needed in our water infrastructure. The U.S. Environmental Protection Agency (EPA) estimates that $384.2 billion will be needed over the next 20 years to repair and replace this infrastructure for the nearly 54,000 community water systems eligible to receive Drinking Water State Revolving Fund (DWSRF) loans.

So how do we fund the upkeep of these assets and, when they finally fail, the replacement of them? You likely already know the answer. Many systems need to raise their rates. But as we all know, many rate payers resist increases in their water bills. Water systems have traditionally found it difficult to raise rates to pay for needed future capital investments. How do we overcome this challenge?

Participate in a dialogue on how water systems can raise rates without causing public outrage.

We need to have a collaborative dialogue among water sector experts to identify strategies that have been effective in communicating with customers on why rate increases are needed. EPA is looking to facilitate this discussion and wants you to participate.

When Will these Discussions take Place?

The "Tap Talks on Tuesdays" discussions will begin in Spring 2014. Each Tuesday during the months of May and June, there will be 1 hour discussions that will take place to hear from water sector professionals on communication approaches that water systems can use in connecting with their customers to explain the need for rate increases.

Who is Invited?

All water sector professionals including water associations, state drinking water staff, technical assistance providers, small, medium, and large sized water system owners and operators, academia, and any other water sector expert who are interested in participating in this discussion.

What Will Come Out of these Discussions?

Communication best practices that water systems can use in effectively communicating infrastructure needs to their customers.

How Do I Get Involved?

If you would like to be a part of these discussions to provide input from your experiences or to learn from what others have done, email Sonia Brubaker at brubaker.sonia@epa.gov with the Subject Line "Tap Talks on Tuesdays" to be added to the stakeholder list.

Let's support water systems with helping customers understand the importance of investing in their community's water infrastructure. *With this collective involvement, we can improve the grade.*

Will YOU help?

Sonia Brubaker is the National Capacity Development Coordinator in the U.S. Environmental Protection Agency's Office of Ground Water and Drinking Water. She specializes in drinking water sustainability initiatives that aim to enhance water system managerial and financial capacity.

Sources

American Society of Civil Engineers. Drinking Water Infrastructure Report Card (2013). Retrieved from http://www.infrastructurereportcard.org/drinking-water/

U.S. Environmental Protection Agency. Drinking Water Infrastructure Needs Survey and Assessment (2009). Retrieved from http://water.epa.gov/grants_funding/dwsrf/upload/epa816r13006.pdf

American Water. Value of Water White Paper (2011). Retrieved from http://www.amwater.com/files/ValueofWater_whitepaper_92711.pdf

Appendix C: Social Media Strategy

Introduction

An increasing number of organizations are using social media to convey messages to a wide range of audiences. This social media strategy will focus on both water sector professionals as well as the "general public," meaning those who are not experts within the water community. This strategy will be incorporated within my Communication Strategies section of my Communications Plan.

Overall Message

The main messages that will be conveyed through social media outreach will be:

- Regular maintenance and replacement of our nation's drinking water infrastructure is necessary for safe drinking water.
- Replacing the country's aging pipes will require significant local investment and water rates will likely have to be increased.

Water rates across the country are traditionally very low compared to the true costs of delivering safe drinking water. Some rates do not cover the full costs of water treatment and delivery, nor the capital improvements and replacement that are needed to keep water safe. The messages above are intended to support water sector professionals in helping the general public, consumers of safe drinking water, understand and appreciate the true cost of what it takes for clean, safe water to get to their taps. If consumers understand infrastructure needs, they will generally be more accepting of water rate increases in their community.

Social Media Use

The professional water sector including water system owners, staff, and decision makers; water associations, state drinking water agencies, technical assistance providers, academia, and other

water sector experts will be the primary audience for this social media strategy. The messages for this campaign will help validate their current and future initiatives in this area and will provide them a platform for engagement with the general public so that they can reach segments of the population who are affected by rate increases, principally water system customers. Some members of the general public will likely have access to the messages first hand as well.

EPA's Office of Water currently has two social media accounts:

- EPA – Water Is Worth It Facebook page
- U.S. EPA Water Twitter account

The Communication Office manages these accounts and authorizes messages that are posted through them. To utilize these accounts to deliver the messages above, I will set up a meeting with them to explain the goals of my overall communication plan and provide them with a schedule for social media communication. Most of the initial communication will result from discussions that take place in the "Tap Talks" sessions that begin in May 2014. I'll commit to developing the short posts and tweets and give the Communication Office full reign to modify as they see fit.

Schedule

March – Meet with the Office of Water's Communication Office

May, week 1 – Prepare Tweet and FB post based on "Tap Talks" discussion

May, week 2 – Prepare Tweet and FB post based on "Tap Talks" discussion

May, week 3 – Prepare Tweet and FB post based on "Tap Talks" discussion

May, week 4 – Prepare Tweet and FB post based on "Tap Talks" discussion

June – Prepare Tweet and FB post on a current drinking water issue

Assessing Success

Engagement is essential for an effective environmental campaign (Thaler, et al. Digital environmentalism: Tools and strategies for the evolving online ecosystem, pg 3). Success of this social media strategy will be evaluated by the following outputs and outcomes:

Outputs

- Number of water sector professionals sharing our information (retweeting Tweets and sharing Facebook posts)
- Number of water sector professionals responding positively to our information (favoriting Tweets and liking Facebook posts)
- Number of water sector professionals engaging in online conversations related to our information (replying to Tweets and replying to Facebook posts)
- Number of new followers in this 6-month timeframe.

Outcomes

- Have any blog posts, articles, or op-eds been written on water infrastructure or water rates during this time period?
- Have any water sector professionals called the Drinking Water Hotline asking about these issues?
- Has the Office Director heard any conversations regarding these issues at conferences and stakeholder meetings during this time period?
- Do I get extra FY15 funding for continuation of these efforts?